NAV∕AIR

NAVAIR Information Technology Case Study

by
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SEPTEMBER 2010

**NAVAL AIR WARFARE CENTER WEAPONS DIVISION
CHINA LAKE, CA 93555-6100**

Naval Air Warfare Center Weapons Division

FOREWORD

This report documents a study conducted between November 2009 and May 2010 to help identify and address implementation challenges in the current NAVAIR IT Procurement Process at the Naval Air Warfare Center Weapons Division (NAWCWD) China Lake, based on survey responses from end users. The work was carried out for NAWCWD and as part of the researcher's Master of Business Administration degree through California State Polytechnic University (CSU) Pomona. This study's online survey was conducted in coordination with the Code 7.2 Information Technology/Information Management Department Head, Scott Weed, and with the approval of the Command Information Assurance Manager, Mark Kolstoe, Code 7.2.6; the NAWCWD Commander, Captain Mark Storch; and CSU Pomona officials.

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29 September 2010

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14. ABSTRACT

(U) This study employed an online survey (with 126 respondents) to investigate variables affecting job satisfaction levels and feelings regarding the NAVAIR IT procurement process among Naval Air Warfare Center Weapons Division (NAWCWD) China Lake end users. Data was analyzed using frequency calculations, scale data (maximum, minimum, mean, and standard deviations), t-tests, Cronbach's alpha, and chi-square tests. Results indicated associations between the IT procurement process and variables such as job satisfaction, work experience, IT software and hardware workarounds, and IT approval training. Results also revealed that employees were satisfied with their jobs but that there was a general lack of awareness of available IT resources. Further studies should include in-depth survey questions designed to explore the IT-resource awareness issue and the workarounds implemented in place of necessary IT software and hardware.

15. SUBJECT TERMS

Case Study, Hardware, Information Technology, IT, Job Satisfaction, Procurement Process, Software, Survey, Training, Work Experience, Workaround

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ACRONYMS

ATO	authority to operate
CalTech	California Institute of Technology
CIO	Command Information Officer
CITI	Collaborative Institutional Training Initiative
CPP	California State Polytechnic University, Pomona
CRB	Customer Review Board
CSU Pomona	California State Polytechnic University, Pomona
DADMS	Department of the Navy Application Database Management System
df	degrees of freedom
EII	Echelon II
FAM	Functional Area Manager
FPGA	field programmable gate array
HARM	High-Speed Antiradiation Missile
HW	hardware
IAM	Information Assurance Manager
IATO	Interim Authority to Operate
IM	information management
IRB	Institutional Review Board
IT	information technology
ITMRA	Information Technology Management Reform Act
MSA	metropolitan statistical area
NAVAIR	Naval Air Systems Command
NAVFAC	Naval Facilities Engineering Command
NAVICP	Naval Inventory Control Point
NAVSEA	Naval Sea Systems Command
NAVSUP	Naval Supply Systems Command
NAWCWD	Naval Air Warfare Center Weapons Division
NAWS	Naval Air Weapons Station
NMCI	Navy/Marine Corps Intranet

ONR	Office of Naval Research
PAO	Public Affairs Office
PEO	Program Executive Officer
PEO(A)	Program Executive Office, Air Anti-submarine Warfare, Assault, and Special Mission Programs
PEO(JSF)	Program Executive Office, Joint Strike Fighter
PEO(T)	Program Executive Office, Tactical Aircraft Programs
PEO(U&W)	Program Executive Office, Unmanned Aviation and Strike Weapons
PID-PR	procurement initiation document/procurement request
POC	point of contact
RDT&E	research, development, test, and evaluation
RFQ	request for quote
RWR	rapid warfighting response
SES	Senior Executive Service
SPAWAR	Space and Naval Warfare Systems Command
SPSS	Statistical Package for the Social Sciences
SW	software
t	t-test
TFS	Target Financial Services
TSS/AMC	Target Sourcing Services/The Associated Merchandising Corporation
WD	Weapons Division

EXECUTIVE SUMMARY

This case study explored the NAVAIR IT procurement process among end users at the Naval Air Warfare Center Weapons Division (NAWCWD) in China Lake, California. An online survey was employed to investigate variables affecting job satisfaction levels and feelings regarding the NAVAIR IT procurement process. The IT procurement process is a very polarizing topic for many and plays an integral role in providing end users with the tools necessary to do their jobs. Any improvements to make the process more efficient and streamlined will help employees do their jobs.

The online survey, sent to 300 end users to collect data for a quantitative study, resulted in 126 voluntary responses. These data were analyzed using frequency calculations, scale data (maximum, minimum, mean, and standard deviations), t-tests, Cronbach's alpha, and chi-square tests. The results indicated associations between the NAVAIR IT procurement process and variables such as job satisfaction, work experience, IT software and hardware workarounds, and IT approval training. Two job satisfaction questions revealed that employees were satisfied with their jobs, which was confirmed by the Cronbach's alpha calculation.

This survey helped highlight the general lack of awareness of available IT resources, which is an issue this project can help address. According to survey responses, the entire IT process is seen as a daunting obstacle with built-in biases against what the process is intended to achieve. Survey responses highlighted some shortcomings that can be directly addressed, which will help end users of this process. Relationships between work experience and IT software or hardware workarounds were confirmed with chi-square calculations; these findings merit further study. Similarly, the finding that IT software and hardware workarounds are used by some end users to accomplish their jobs, needs to be investigated in greater depth. Although the IT approval process adds more complexity to the procurement process, it is not meant to be such a hindrance that users are forced to find other means to accomplish jobs. The findings from this survey should help to address this issue.

Further exploration, with more in-depth survey questions, is recommended to gain an understanding of the variables surrounding the awareness of IT-related issues and to better characterize the IT hardware and software workarounds being implemented.

INTRODUCTION

This case study examines the information technology (IT) procurement process in place at the Naval Air Systems Command (NAVAIR) China Lake site, focusing on the interaction between China Lake's IT procurement process and the end user's job satisfaction level. Some topics considered include how end users feel about the current process, how their reliance on computers and IT affects their job satisfaction, and how NAVAIR IT procurement processes compare to those in other industries.

IT is prevalent in many industries today and plays a vital role in the success of a company. One definition of IT asserts that it "deals with the use of electronic computers and computer software to convert, store, protect, process, transmit, and securely retrieve information" (Reference 1). This very broad definition helps to underscore the fact that IT affects many areas central to the business activities of modern enterprises (Reference 2).

The IT procurement process for NAVAIR's research, development, test, and evaluation (RDT&E) network falls under Navy regulations for accreditation of their IT systems. NAVAIR is a part of the United States Navy, providing support for naval aircraft and airborne weapons systems (Reference 3). The Navy has five systems commands: NAVAIR, Naval Sea Systems Command (NAVSEA), Space and Naval Warfare Systems Command (SPAWAR), Naval Facilities Engineering Command (NAVFAC), and Naval Supply Systems Command (NAVSUP) (Reference 3). A Navy organizational chart is shown in Figure 1.
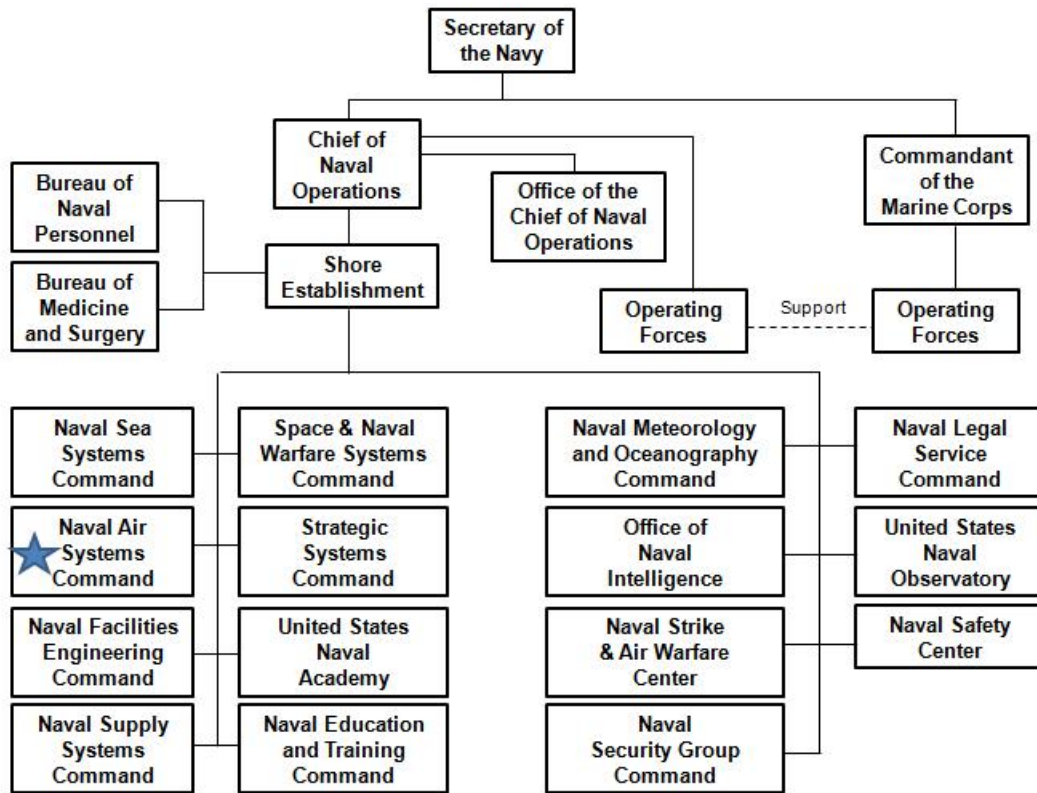
FIGURE 1. Navy Organizational Chart (Reference 4).

NAVAIR BACKGROUND

NAVAIR employs approximately 32,000 military and civilian personnel, manages 150 acquisition programs, and maintains over 4,000 aircraft (Reference 5). NAVAIR also works closely with industry to deliver products and support (including aircraft, avionics, air-launched weapons, electronic warfare systems, and missiles) directly to operating forces. Some examples of this work are the Sidewinder and Tomahawk missile systems and the development work on F/A-18 and F-14 planes (Reference 6).

NAVAIR's mission can be summarized in the following statement:

> "Sailors and Marines armed with confidence because we develop, deliver, and sustain aircraft, weapons and systems on time and on cost with proven capability and reliability so they succeed in every mission and return home safely" (Reference 7).

NAVAIR is comprised of the following six organizations, which work as a fully integrated team (Figure 2):

- The Naval Air Systems Command, NAVAIR
- Program Executive Office, Air Anti-submarine Warfare, Assault, and Special Mission Programs PEO(A)
- Program Executive Office, Tactical Aircraft Programs PEO(T)
- Program Executive Office, Unmanned Aviation and Strike Weapons PEO(U&W)
- Program Executive Office, Joint Strike Fighter PEO(JSF)
- Naval Inventory Control Point (NAVICP)

The Naval Air Warfare Center Weapons Division (NAWCWD) is within the six organizations of NAVAIR. This case study focuses on the NAVAIR IT procurement process as implemented at the NAWCWD China Lake site.

ORGANIZATIONAL STRUCTURE
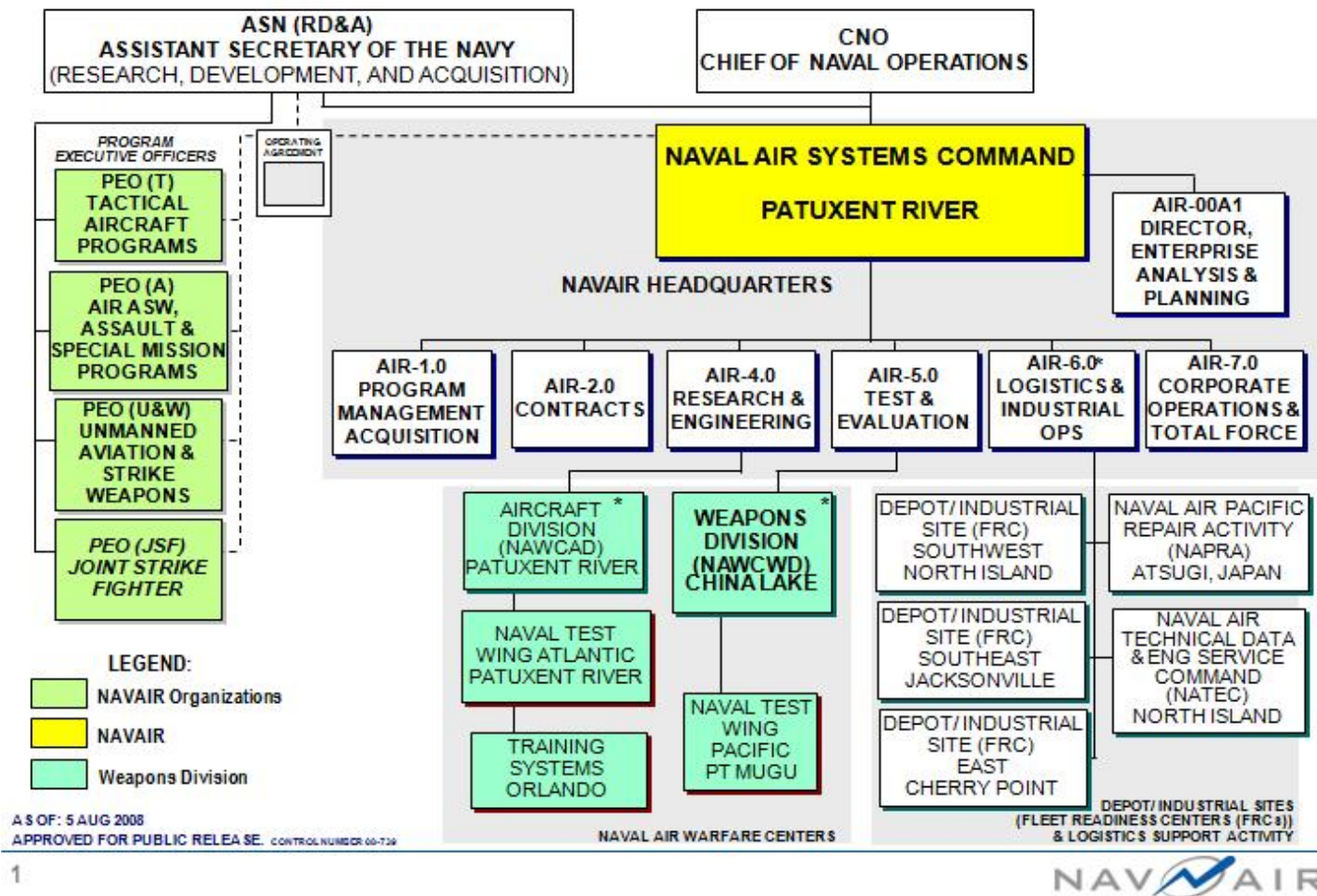
FIGURE 2. NAVAIR Organizational Structure (Reference 8).

NAWCWD BACKGROUND

NAVAIR, headquartered in Patuxent River, Maryland, is split into three sections (Weapons Division, Aircraft Division, and NAVAIR depots). These three sections are dispersed among eight continental United States sites (Figure 3).
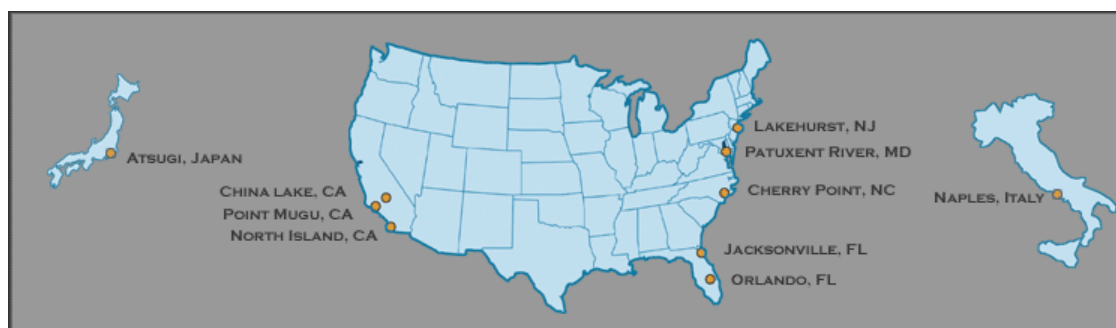
FIGURE 3. NAVAIR Locations (Reference 9).

NAWCWD (Weapons Division) is located at two California sites: China Lake and Point Mugu. The Aircraft Division has three sites: Patuxent River, Maryland; Lakehurst, New Jersey; and Orlando, Florida. The three NAVAIR depots are located in North Island, California; Jacksonville, Florida; and Cherry Point, North Carolina.

NAWCWD CHINA LAKE BACKGROUND

The China Lake Weapons Division site was founded during World War II through a joint Navy and California Institute of Technology (CalTech) effort to establish an aviation ordnance proving ground. China Lake is located relatively close to CalTech's base in Pasadena and provides year-round flying weather, as well as nearly unlimited visibility, making it an excellent location for a weapons-testing facility.

The China Lake site was created in 1943 from the following mandate, "…A station having for its primary function the research, development and testing of weapons, and having additional function of furnishing primary training in the use of such weapons" (Reference 6). With over 1.1 million acres of land, China Lake has the capability to test live ordnance with a variety of scenarios (Reference 5). This has enabled testing of ballistic products created at China Lake, as well as those developed through joint ventures with contracting companies. There are few other places in the United States offering the types of testing possible here. Depending on the project, China Lake personnel can either develop the item in-house, work with industry partners to create it, or have contractors within the industry develop the project.

China Lake employs more than 4,000 civilians, about 1,000 military personnel, and approximately 1,500 contractors in fields such as energetics, robotics, aircraft survivability, munitions, and targets engineering. China Lake provides full-spectrum aircraft, weapons, and systems capabilities ranging from development, testing, and evaluation activities to production and sustainment. Notable efforts that have emerged from China Lake include the Sidewinder, Sparrow, and Phoenix air-to-air missiles, the Harpoon anti-surface missile, the Tomahawk cruise missile, the Sidewinder Antiradiation Missile (Sidearm), the High-Speed Antiradiation Missile (HARM), and the Walleye television-guided glide bomb. China Lake has also developed technology that is available for commercial use, such as the chemiluminescent light stick, the continuous emissions monitoring system, and calcification prevention tablets (References 10 and 11).

IT plays a critical role in the work undertaken at NAWCWD China Lake, whether that be the use of programs or hardware to design, develop, or test new products or simply as a means of providing common correspondence with others who are part of the Navy/Marine Corps Intranet (NMCI) network. At China Lake, there are two main IT networks: (1) the NMCI network, which provides email and Internet connectivity for the Navy overall, and (2) the Research, Development, Test & Evaluation (RDT&E) network, which is used by separate groups for Internet connectivity and software installation.

The RDT&E network hosts computers that are allowed to network and install research and development software that cannot be installed on the NMCI computers. Although both networks can provide Internet connectivity, the greater flexibility of the RDT&E network allows end users to work with many programming suites and other engineering software not available to NMCI-users. RDT&E-users can also have stand-alone computers that are not connected to the Internet. These stand-alone systems are mainly installed in laboratory environments, where they are connected to other test equipment and computers.

IT BACKGROUND

On 10 February 1996, the Information Technology Management Reform Act (ITMRA) was signed into law by the President. When combined with the Federal Acquisition Reform Act, the Clinger Cohen Act was created, with the purpose of streamlining IT acquisitions while minimizing the layers of approvals from the previous system (Reference 12). The Clinger Cohen Act of 1996 defines IT in the following way:

"The term 'information technology,' with respect to an executive agency means any equipment or interconnected system or subsystem of equipment, that is used in the automatic acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data or information by the executive agency. For purposes of the preceding sentence,

equipment is used by an executive agency if the equipment is used by the executive agency directly or is used by a contractor under a contract with the executive agency which (i) requires the use of such equipment, or (ii) requires the use, to a significant extent, of such equipment in the performance of a service or the furnishing of a product" (Reference 12).

This very broad definition, outlined in the Clinger Cohen Act, means that many items are considered IT, including not only computers but also data collection units and other items that interface with computers. Most of the work done by the engineers and scientists at China Lake involves computers. As such, computers play a vital role on base, and a lengthy IT procurement process could hinder or even temporarily halt productivity.

IT PROCUREMENT BACKGROUND

The Navy has a specified process for the procurement of IT items, which include software as well as hardware. When purchasing an IT item, a Command Information Officer (CIO) NAVAIR IT tool is used to input the relevant information to gain approval for the purchase. For software, the entire purchasing process is relatively simple as long as the request originates from an approved lab with an Authority to Operate (ATO) or Interim Authority to Operate (IATO). Additionally, the IT software and version number must be located in the Department of the Navy Application Database Management System (DADMS) database with the China Lake site listed as an approved stakeholder to run the software.

The process for procuring IT hardware is similar to the software procurement process, with the following differences. When purchasing IT hardware, an approved lab is again the starting point. But unlike with software, hardware must be compared against the NMCI Contract Line Items, which is a list of hardware provided by NMCI from their contract. If the hardware is not on the list, it passes this first test. From there, the hardware information is put into the CIO NAVAIR IT tool to start the approval process. Any software installed on the hardware at the point of initial purchase is also put into the IT approval, which helps to merge the two processes. The process can also be used individually if only hardware or software is included in the procurement.

The problems with the IT process stem from any deviations from this formula. DADMS is the database of approved software for the Navy. It contains all of the software that is approved for use on the RDT&E network and lists the individual stakeholders authorized to operate the software. Adding additional software titles and newer versions of software to the DADMS database, requires China Lake to become a stakeholder and gain the necessary approvals, which can result in long lead times. When adding software titles to the database, a NAVAIR Echelon II (EII) Functional Area Manager (FAM) form is filled out.

On the IT hardware side, trying to create a new lab of computers without an approval to operate is an extensive process involving the competency Information Assurance Officer and a Customer Review Board (CRB) meeting. There are many steps involved in the process to create an accredited laboratory, and the details are too comprehensive for this case study. Likewise, the process for procuring items for use on the NMCI network, which differs from RDT&E IT procurement process, will not be covered in this study.

IMPORTANCE OF THE TOPIC/NEED FOR RESEARCH

This case study will help bridge the knowledge gap regarding the role of the IT procurement process and job satisfaction of NAVAIR employees. It will also explore how the NAVAIR process compares with different companies in industry, as well as how end users at NAWCWD China Lake feel about the process. The research for this case study will follow previous work done with IT workers selected from 12 metropolitan statistical areas (MSAs) in the United States but will focus on NAVAIR at the NAWCWD China Lake site (Reference 13).

The procurement process required for China Lake labs and programs when purchasing new IT items can be directly correlated to the amount of work employees are able to accomplish. Depending on the items ordered, the NAVAIR procurement process can take from a few days to several months to accomplish while forms are assessed and review boards are created to pass judgment. (The influx of new workers on three-month job rotations during their first year helps to highlight the need for a quick turnaround when procuring IT.)

STATEMENT OF PURPOSE

This case study will investigate whether the current NAVAIR IT procurement process is reducing job satisfaction of end users because of its complexities and inefficiencies. Specifically, this study will address the following questions:

(1) To what extent are end users satisfied with the current IT procurement process?

(2) To what extent does reliance on the IT procurement process to acquire the tools to perform one's job affect workers' job satisfaction levels?

(3) To what extent do demographic factors such as length of employment affect end users' feelings regarding the procedures in place for IT procurement?

(4) How do the IT procurement procedures in other industries compare to NAVAIR's IT procurement process?

LITERATURE REVIEW

INFORMATION TECHNOLOGY INTRODUCTION

This literature review will focus primarily on the NAWCWD China Lake IT procurement process and will compare this process to those used by other companies in industry. Interviews will be conducted with various employees in the commercial sector to document the processes in place for their companies. The current documentation for the NAVAIR IT procurement process will be examined within this literature review. The *Information Technology and Worker Satisfaction* case study by J. Danziger and D. Dunkle in Irvine, California, (Reference 13) will be used for some of the survey questions to explore the relationship between job satisfaction and employee turnover/retention rates (References 14 and 15).

The great expense of IT solutions and their impact on worker productivity can significantly affect the products and services delivered to the fleet. A huge fiscal and productivity impact can be seen with NMCI, which was a $9.9 billion dollar, ten-year contract to provide connectivity and email Navy wide (Reference 16). When these types of dollar figures are involved, the significance of IT to the overall budget becomes apparent.

NAVAIR IT PROCUREMENT BACKGROUND

There are many steps involved in the procurement process before authorization for an IT purchase is granted. If all of the paperwork is in order, approval can be gained in five steps. The acquisition process flow for an IT software procurement approval is shown in Figure 4. As can be seen from the flow chart, answering "No" at any of the stages involves not only more work but also additional lead time for the procurement.

NAVAIR IT Process for Software Approval
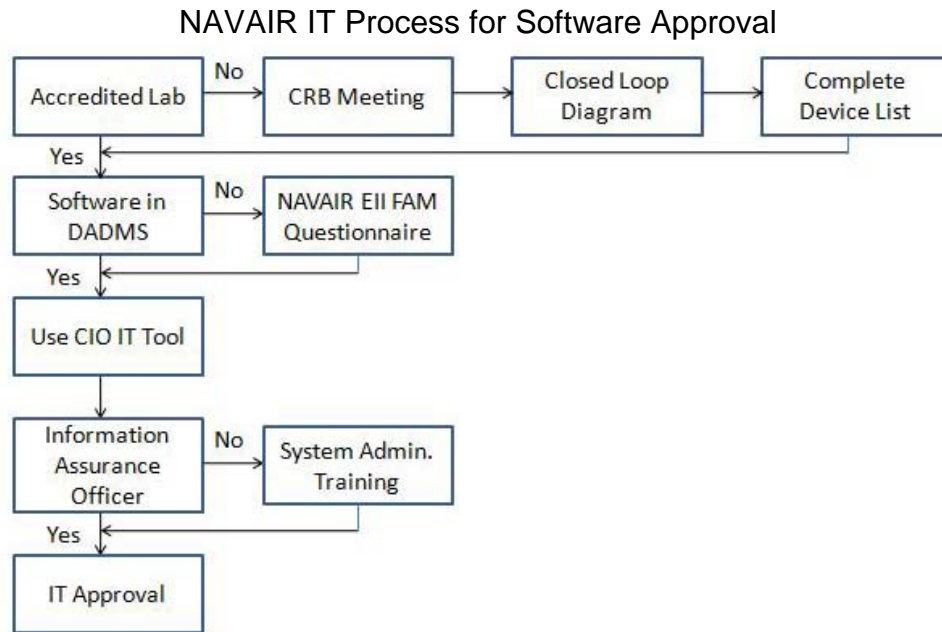
FIGURE 4. NAVAIR Software IT Approval Process.

After completing all of the steps in the IT Approval Process, the purchasing process must also be navigated (Figure 5). These two flow charts combined show the entire IT procurement process from approval to purchase.

NAVAIR IT Process for Software Purchase
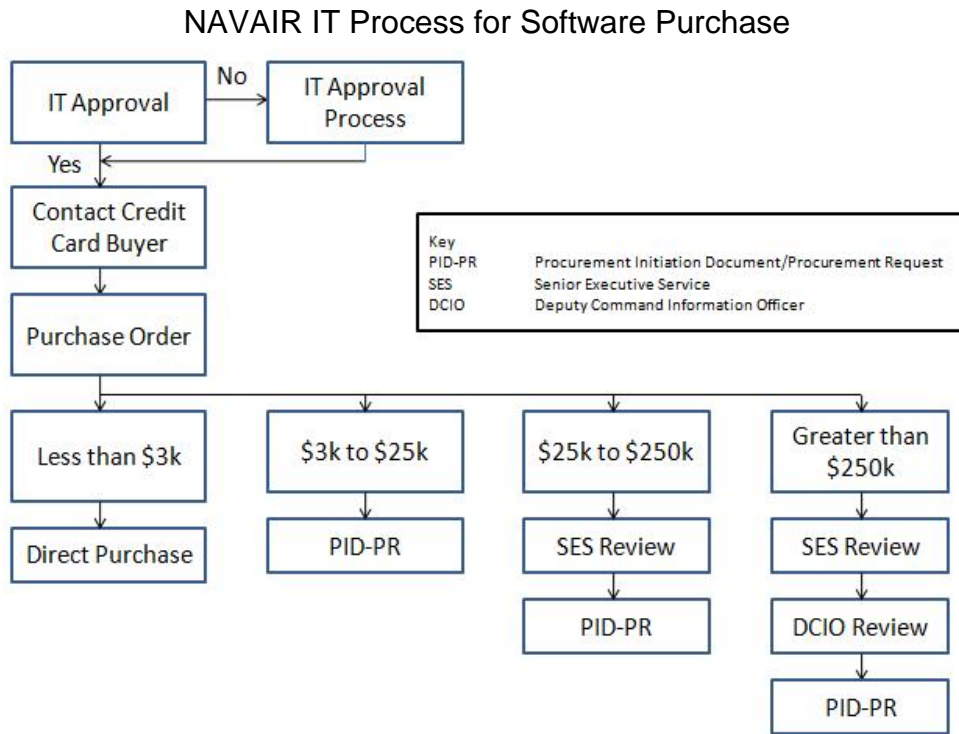
FIGURE 5. NAVAIR Software IT Purchase Process.

NAVAIR IT PROCUREMENT PROCESS

The exact purchasing process depends on the amount of the total procurement. If the purchase is less than $25K, the process is relatively fast and straightforward (Figure 6). (The survey portion of this case study will investigate how end users feel about the process when making smaller purchases (less than $3K), thereby qualifying for a direct purchase.) After making the IT request using the CIO website's IT Tool, the request is reviewed by the IT point of contact (POC). A successful IT submission can be approved within one working day, which leads into the procurement process. A general overview of the purchasing process can be seen in Figure 6.
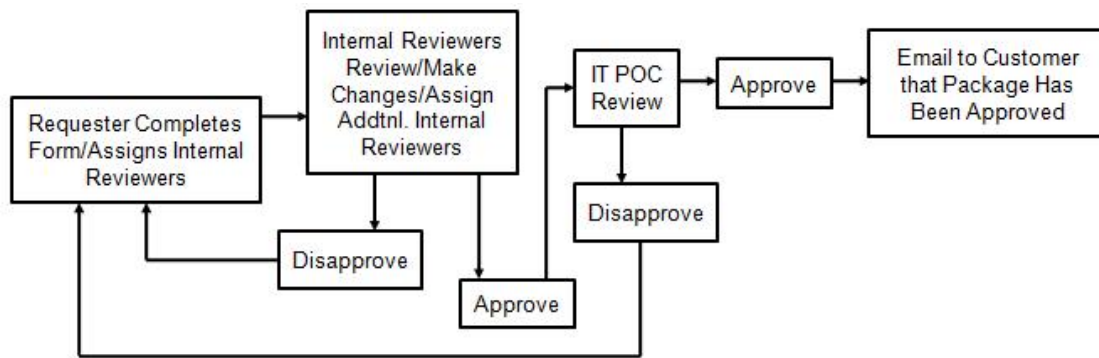
FIGURE 6. IT Approval Process for Purchases under $25K.

With an IT approval, purchases of $3K or less involve a straightforward procedure in which an authorized government credit card buyer can make the purchase. Since this price category covers a wide range of items needed by end users, these small purchases are where the majority of users interact with the IT approval/procurement process. Items purchased at this price point are small acquisitions that do not involve contracts, which greatly reduces the time it takes to acquire the items. Items that typically fall into this category include new computer systems, field programmable gate array (FPGA) development boards, software, and various other items for a single computer system. Any increases in the process efficiency of these acquisitions will have an immediate positive effect on the end user.

The procurement strategy differs for purchases greater than $3K but less than $25K. For these purchases, the Procurement Initiation Document/Procurement Request (PID-PR) process must be started. This process involves the Contracts Department (Code 2.0) issuing a Request For Quote (RFQ), where the procurement is placed up for bid by vendors hoping to fulfill the request. One part of this process can involve a down-selection for the item in question, in which the end user evaluates all the submittals, choosing which proposals fulfill the required technical specifications. Contracts Department personnel then award the final contract from the qualified list. These contract purchases can take anywhere from one to two months to accomplish.

With IT purchases over $25K, the process is much more rigorous and lengthy, as seen in Figure 7. For such large purchases, there are many more reviews, in addition to the interactions with the Contracts Department. Further, for purchases over $250K, the process also includes a Senior Executive Service (SES) review (Figure 7). Since there is much more scrutiny for such large capital purchases, having a purchase that costs less than $25K can greatly reduce the procurement time. When looking to make larger purchases, end users need to allocate enough lead time for the procurement to flow through the system. Additionally, end users must ensure that the funding used to make the acquisition will still be valid by the time the purchase is completed.
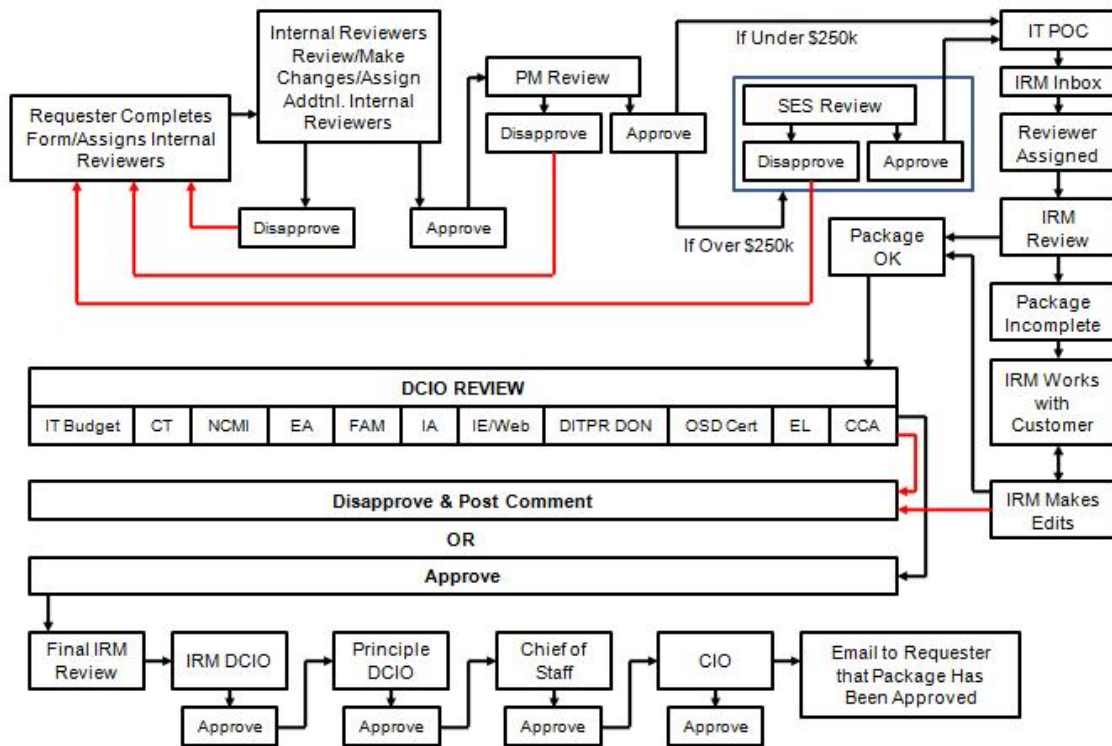
FIGURE 7. IT Approval Process for Purchases Over $25K.

JOB SATISFACTION

Job satisfaction is a well researched topic that can be grouped into three main focus areas: elements that make up job satisfaction, internal and external factors that influence job satisfaction, and consequences of job satisfaction on organizations and individuals (Reference 17). With that in mind, there are the five main facets of job satisfaction: pay, promotion, coworkers, supervisors, and the work itself.

When looking at the first two facets, the compensation a worker receives in pay is seen as a central factor when attempting to motivate performance. Workers want to feel they are earning "fair pay" for their day of work (Reference 18). With pay differentials in many companies, some workers are higher paid than others. This pay differential is called dispersion of pay, and within an organization's hierarchy, some workers may earn a great deal more than others (Reference 19). Although it is understood that everyone can't be at the top of the earnings curve of a company, finding the balance where people feel they are being paid and valued for their contributions is critical.

Similarly, coworkers play a large part in how a worker feels about his or her job. Working in a team environment can act as a form of control to worker behavior, which can help to increase total output. The enhanced performance of workers has been traced to team working environments, as compared with the autonomous results of individual workers in some cases (Reference 20). By working in a team, teammates can help to increase the work effort of the individual. Performance can be increased when workers wish to avoid letting teammates down while performing joint tasks.

Concerning the supervisor facet of job satisfaction, workers want feedback to know if they are performing well. They also desire to have an authority to turn to with questions. Supervisors serve as a key piece in the authority chain and hold a higher status in the overall social grouping. The supervisor acts on behalf of the organization as a whole, while being separated from other employees by the hierarchies of accountability and responsibility (Reference 21).

The main focus of this research project is worker satisfaction. Job satisfaction has been linked to employee motivational theories from work dating back to Herzberg in the 1950s (Reference 22). When considering what motivates workers and gives them satisfaction with their jobs, Herzberg proposed the two-factor theory of job satisfaction (Reference 23). This theory focuses on motivators and hygiene factors, in which motivators refer to the work itself, achievement, and outcomes resulting from this work, all of which were linked to high levels of satisfaction. Hygiene factors, on the other hand, are things that minimize dissatisfaction and are associated with things such as working conditions, company policies, or pay (Reference 23).

Research has been done linking job satisfaction with employee turnover/retention rates (References 14 and 15). With a location as isolated as the NAWCWD China Lake site, the desire is to minimize employee turnover as much as possible. On the other hand, everyone is different, and no one job will satisfy two individuals in exactly the same way (Reference 24). This project and survey will help to identify the general feelings of many workers who are affected by the IT procurement process.

METHODOLOGY

RESEARCH DESIGN

This study utilizes a descriptive research design to explore the extent to which a reliance on computers to perform one's job affects job satisfaction levels. Conventional variables will be examined that have been associated with job satisfaction. Some questions from Danziger and Dunkle's *Information Technology and Worker Satisfaction* case study have been used to help assess the extent to which the computing environment, the overall use of computing, and the degree of dependence on computing to complete work tasks are associated with job satisfaction (Reference 13). This study's survey also included questions regarding the IT procurement process as implemented at NAWCWD China Lake.

This project's research design used the survey results from end users whose experience ranges from novice to expert with the NAVAIR IT procurement process. The survey data was collected through an email link to an online survey hosted on Zoomerang (Appendix E). The email message (Appendix A) was generated from the researcher's work email account and included an attached Memorandum for Record from the NAWCWD Commander (Appendix B) authorizing employees to use official time when completing the survey during working hours. The email message itself had concurrence from the Head of the Information Technology/Information Management (IT/IM) department, as well as from Command Information Assurance Manager (IAM). Because of the strong feelings regarding IT-related issues on the base, this initial coordination work was important to ensure that the appropriate contacts were included.

An exploratory research design was used to obtain qualitative data from various sources in industry to gain insight into the procurement processes they have in place. Qualitative data was collected in interviews, and the data was then used to create industry flow charts (in a format similar to the ones generated by the researcher for the NAWCWD China Lake process) to help define the procurement processes at these companies.

SAMPLE

This case study used a large sub-sample, with 300 surveys sent out. Respondents were IT end users at the NAWCWD China Lake site. All of the individuals work at China Lake and have access to government email accounts. The sample respondents were taken from a list of users on the IT/IM email list, as well as employees the researcher knows personally. The final sample size was 126 participants.

The qualitative portion of this case study included data collected from individual users in industry who were interviewed to find out the processes in place for their respective organizations. Four employees were interviewed to collect qualitative data.

DATA COLLECTION

Data on the NAVAIR IT procurement process was collected with an online survey hosted by Zoomerang. The survey was launched 18 March 2010 and remained open for one week. To gain proper approval for this survey, the researcher first took the California State Polytechnic University, Pomona (CPP)–Introduction to Human Subjects 101 online class to fulfill the Collaborative Institutional Training Initiative (CITI) requirement before starting the California State Polytechnic University, Pomona (CSU Pomona) Institutional Review Board (IRB) process. The survey instrument as well as the online hosting site, the informed consent form, and other information were vetted through the CSU Pomona process.

For the China Lake approval process, the NAWCWD Commander granted a Memorandum for Record to release the survey on base, permitting 300 employees to complete the survey during working hours. Next, the survey questions went through the NAWCWD Public Affairs Office (PAO) public release process. After permission for public release was granted, the IRB packet was submitted to CSU Pomona.

When the IRB packet was accepted and cleared by CSU Pomona (Appendix C), it then needed to be submitted to Dr. Jones of the Office of Naval Research (ONR) for approval (Appendix D). Once granted, proof of ONR approval was submitted to the IRB committee, thereby clearing the survey for administration to users at China Lake.

After the survey was launched, the email including the survey link informed participants that the survey was entirely voluntary and the data collected would be non-attributable to individual respondents. Participants were also informed that the aggregated data would be included in a report to the head of the IT/IM department.

The qualitative interview data was collected from 1 to 13 November 2009. It involved face-to-face interviews to collect information on how each company implements its IT procurement process. Each employee gained company approval to release this information.

MEASURES

The survey includes 35 questions in total: five demographic questions, 20 job satisfaction questions, and 10 NAVAIR IT procurement questions. Some work environment and job satisfaction questions were taken from Danziger and Dunkle's

Information Technology and Worker Satisfaction case study (Reference 13), to be used as a tool to compare results. The questions about job satisfaction are on a five-point scale, ranging from "Definitely Yes" to "Definitely No." A few example statements include, "I enjoy my job," and "I have a lot of say over what happens in my job."

The demographic portion of the survey includes questions regarding years of work experience, employment status, and highest level of education completed. Some portions of the Danziger and Dunkle study (Reference 13) were used to verify the reliability and validity of their instruments in the work environment section. The NAVAIR IT procurement process questions were developed by the researcher with help from the IT/IM director, so this instrument has no known reliability or validity.

DATA ANALYSIS

The data from the online survey was entered into the Statistical Package for the Social Sciences (SPSS). To ensure accuracy, missing items were labeled, four questions were recoded, and Cronbach's alpha was run on the job satisfaction and NAVAIR IT procurement questions. Cross tabulations were run to examine relationships between work experience, IT approval training classes, IT software workarounds, IT hardware workarounds, IT software needed to do the job, and IT hardware needed to do the job. The cross tabulation data also had Pearson's chi-square run against it.

LIMITATIONS

One limitation of this study is that the online survey was sent only to a limited subset of the entire NAWCWD China Lake population who uses the IT procurement process. There are many users impacted by this process who were not represented in the responses. Additionally, the survey was open for only one week, which limited the number of responses received from the 300 invitations sent out. The survey questions regarding the NAVAIR IT procurement process were created by the researcher; therefore, any biases or limitations with these questions have not been thoroughly tested/refined, compared with established scales, to fully validate this instrument.

INTERVIEW DATA

Industry Analysis–Large Companies

Apple. Apple is an American multinational technology corporation that employs approximately 35,000 people, with products such as iPod (portable music player), MAC computer, iTunes (music program), and MAC OS (operating system). Apple, headquartered in Cupertino, California, was established in 1976 and incorporated in 1977

(References 25 and 26). To find out more about Apple's IT procurement process, an Apple IT Manager was interviewed (Reference 27).

The Apple IT software procurement process (Figure 8) is very simple if the software is available as part of their site-license software depot. If it is on the software depot list, employees request the software, and it is deployed onto their computers.

Apple IT Process for Software Procurement
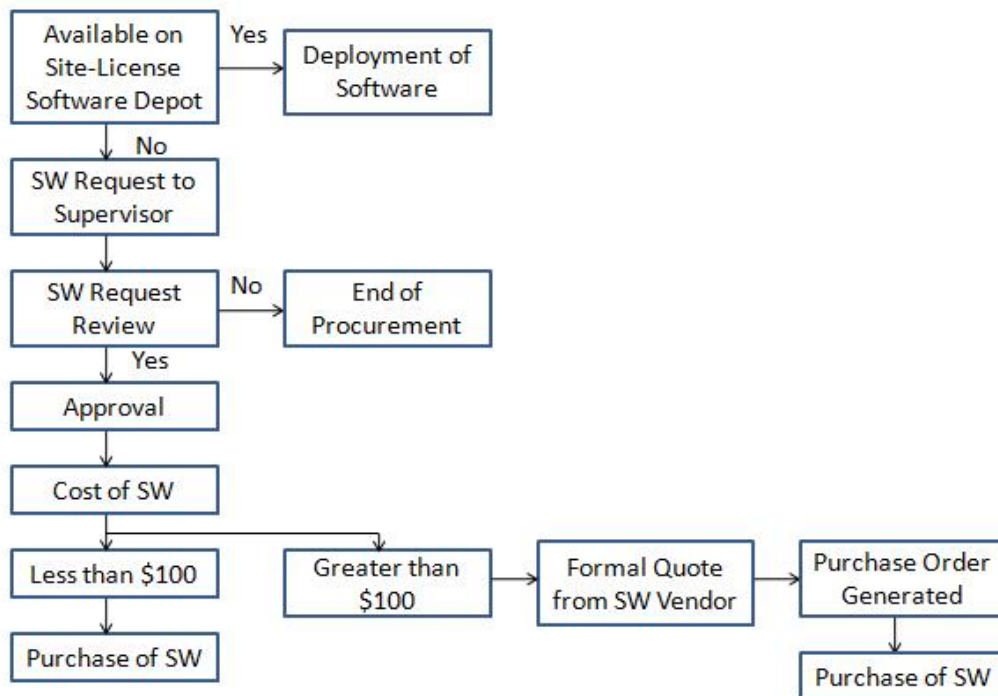
FIGURE 8. Apple's Software IT Procurement Process.

With software not located on the software depot, the employee needs to place an email request to his or her supervisor for the software to be purchased. If this request is denied, the process stops right there. If it is approved, the software request is reviewed, and if approved, the purchase request is forwarded to a purchaser. If the cost of the procurement is greater than $100, a formal quote from the software vendor is required for the purchase.

When comparing Apple's process to NAVAIR's, the biggest difference is the site license that Apple has with their software depot, which can lead to quick deployment of a limited software inventory. However, if the software in question isn't on the depot list, Apple employees go through a process similar to NAVAIR's.

Google. Google is an Internet search engine company that employs approximately 20,000 people. It was founded in 1998, with headquarters in Mountain View, California. Besides providing a search engine from their main page, Google also provides numerous services, only a few of which include Gmail (web email), Google Maps, Google Chrome (web browser), and Picasa (picture organization program) (Reference 28). Most of Google's revenue, however, is generated from their advertising programs (Reference 29). To gather more information about Google's Internal IT procurement process, a Google Webmaster Manager was interviewed (Reference 30).

The Google procurement process (Figure 9) is very simple if the software is available internally. If so, employees simply choose the necessary software from Google's internal website and gain manager approval. The software is then deployed either remotely or onsite.

With software not available internally, the request is given to a manager for approval. After approval, the software can be purchased with a company credit card. To complete the transaction, a reimbursement is submitted online to cover the cost of the procurement. If there is a denial at any stage of the procurement process, the software acquisition is stopped.

When comparing Google's process with NAVAIR's, one major difference is Google's internal website with software available for deployment. Google's database of available applications greatly speeds the process of getting the software into the end user's system. With the NAVAIR process, on the other hand, every piece of software must go through the approval and purchasing processes.

Google Software Procurement
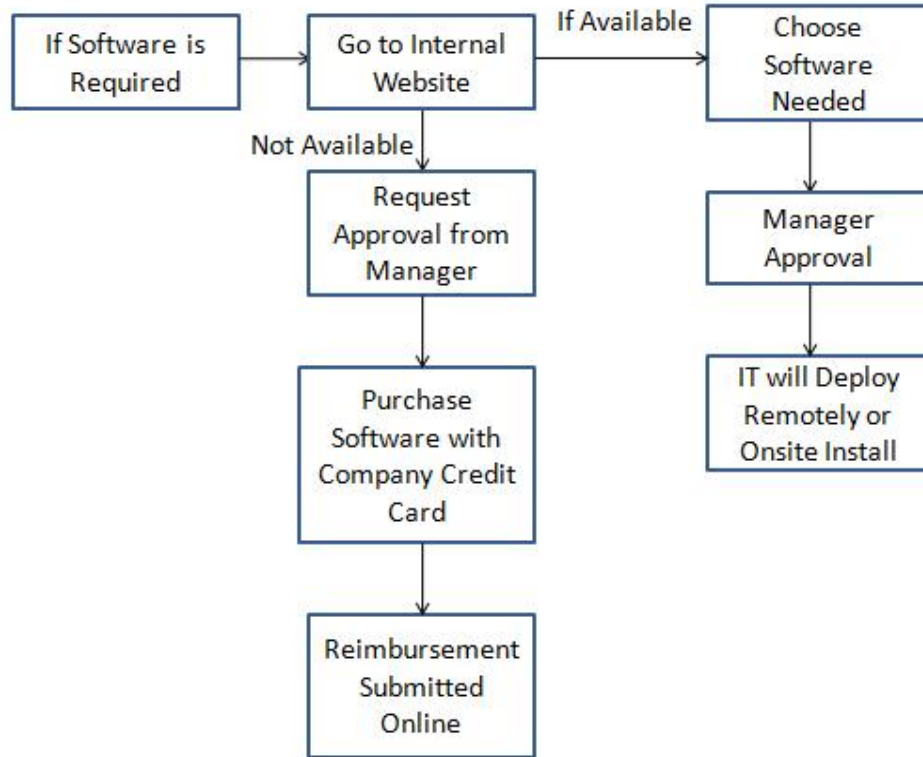
FIGURE 9. Google's Software IT Procurement Process.

Target. Target Corporation, known as Target, is an American retailing company headquartered in Minneapolis, Minnesota, and employing approximately 351,000 people. Target is the second largest discount retailer in the United States behind Wal-Mart with both a brick and mortar store presence and an online web page. They have many subsidiaries, including Target Financial Services (TFS), Target Sourcing Services/The Associated Merchandising Corporation (TSS/AMC), and Target Brands (private label products). Typically, Target stores carry clothing, shoes, jewelry, electronics, kitchen supplies, and various other items (References 31 and 32). To find out more information about Target's software procurement process, a District Human Resources Business Partner was interviewed (Reference 33).

Most of the software Target associates use is automatically pushed onto their computers by IT staff. For a majority of the updates, associates are emailed and notified to keep their machines on overnight so the software pushes can be completed. On the whole, Target does not deal with specialty software packages.

For software requests of special items, the "InsideTGT" form is filled out. The form is reviewed by a supervisor and either approved or rejected. If approved, a purchaser is given authorization to make the buy. The process for specialty software items is shown in Figure 10. Target's procurement process is similar to many other companies although Target's need for various software suites is much less compared with technology companies that depend on IT for development.

Target IT Process for Software Procurement Special Items
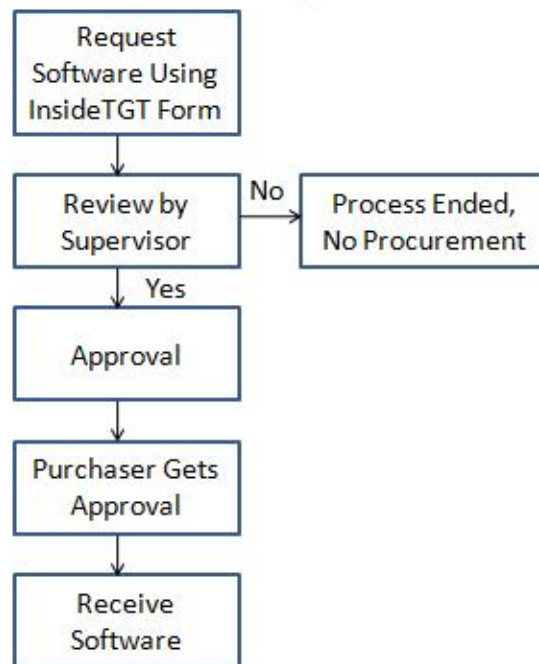
FIGURE 10. Target Software IT Procurement Process.

Industry Analysis–Medium-Sized Companies

Aprimo. Aprimo is a software company with approximately 350 employees. Although headquartered in Indianapolis, Indiana, Aprimo has offices throughout North America, Europe, and Asia (Reference 34). This company provides an Enterprise Marketing Management product (integrated marketing software) offering improvements such as faster budget status updates for marketing departments or increases for campaign volumes. Some of Aprimo's customers include Bank of America, AT&T Mobility, The Home Depot, Johnson Financial Group, Time Warner Cable, and Warner Brothers. To

find out more about Aprimo's IT procurement process, a Technical Practice Lead was interviewed (Reference 35).

Aprimo has two main software procurement paths depending upon whether the software is or is not in direct support of a client (Figure 11). When supporting a client, the acquisition process is very simple. The employee puts the request directly through the client to gain approval. For software requests not in direct support of a client, the process is initiated by contacting a manager, who then goes through the steps outlined in Figure 11. When there is a "No" in the process, an alternative solution is then implemented. The alternative solution usually consists of making do with the current software. For example, if the screen-capture software Snagit (which allows users to capture and print the current screen display) were requested and rejected, using the Print Screen option as a workaround would produce the same effect. The solution would not be as elegant and integrated as the Snagit software, but the task could still be accomplished.

Aprimo IT Process for Software Procurement
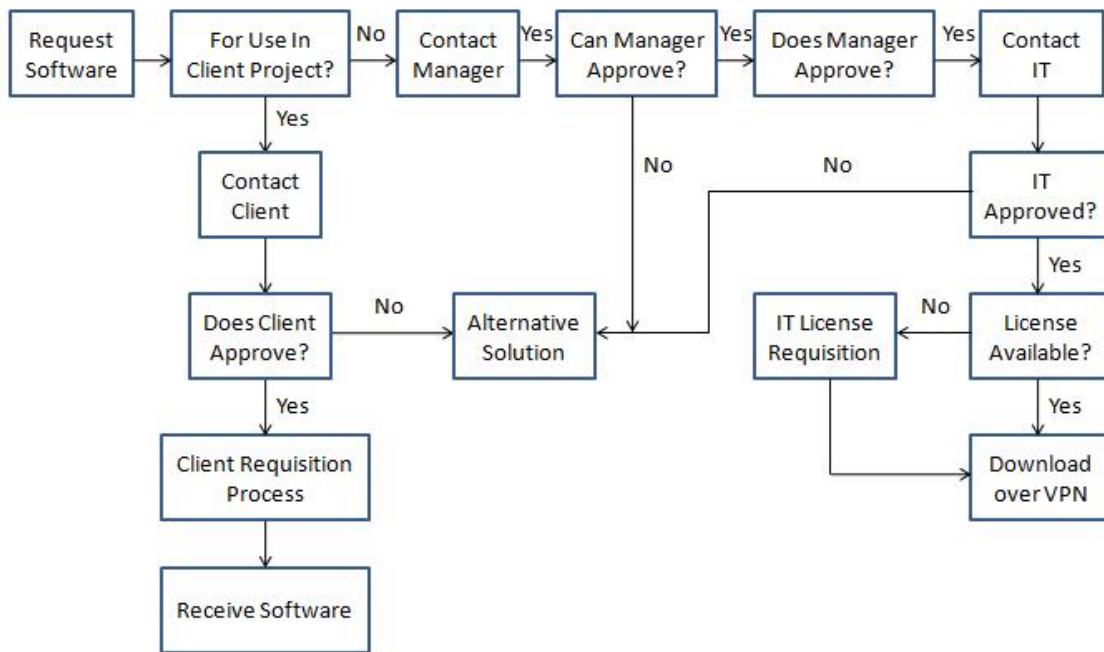
FIGURE 11. Aprimo's Software IT Procurement Process.

Aprimo's IT acquisition process is much less formal than NAVAIR's. This can be expected since Aprimo's policy affects a much smaller user base, and much less support is required. The size of the company, as well as the regulations it must follow, play a large role in its IT policy needs.

Life Technologies. Life Technologies is a global biotechnology company that employs approximately 9,500 people. This company works to advance personalized medicine, regenerative science, molecular diagnostics, agricultural and environmental research, and 21st century forensics. Life Technologies, which was created by combining Invitrogen Corporation and Applied Biosystems Inc., had sales of more than $3 billion in 2008. They are headquartered in Carlsbad, California, and operate in more than 100 countries (Reference 36). To find out about this company's IT procurement process, a Senior Electronic Engineer was interviewed (Reference 37).

Life Technologies has a relatively simple, four-step IT procurement process (Figure 12). This company combines the approval and purchasing of software into one process, while NAVAIR separates it into two.
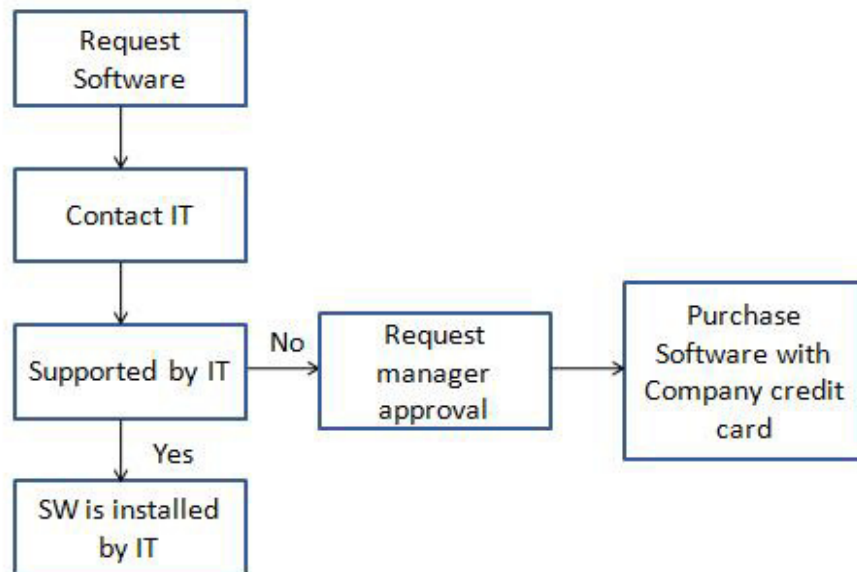
FIGURE 12. Life Technologies Software IT Procurement Process.

Life Technologies is a smaller organization than NAVAIR, with a more streamlined IT process. If the IT department supports the software the user wants installed, IT takes care of the rest of the paperwork, and the end user is provided with the software. For

software not supported by the IT department, a manager's signature is required, which leads to a purchase with the company credit card.

RESULTS

DEMOGRAPHIC CHARACTERISTICS OF NAVAIR
IT SURVEY RESPONDENTS

Table 1 shows the frequencies and percentages of demographic characteristics. The majority of the sample responses were full-time NAWCWD employees (97.6%), while the rest were contractors (2.4%). Missing data was excluded from this table.

TABLE 1. Employment Status.

Employment	Frequency	Percent	Valid Percent	Cumulative Percent
Full-time NAWCWD employee	122	97.6	97.6	97.6
Contractor	3	2.4	2.4	100.0
Total	125	100.0	100.0	

Table 2 shows that in terms of work experience, more than half of the respondents had less than 11 years of work experience (60%), while a third had 21 or more years of experience (30.4%). Those with 11 to 20 years of work experience made up a small proportion of the sample (9.6%). Missing data was excluded from this table.

TABLE 2. Work Experience.

Years of Work Experience for NAWCWD	Frequency	Percent	Valid Percent	Cumulative Percent
Less than 1	1	0.8	0.8	0.8
1 to 5	36	28.8	28.8	29.6
6 to 10	38	30.4	30.4	60.0
11 to 15	5	4.0	4.0	64.0
16 to 20	7	5.6	5.6	69.6
21+	38	30.4	30.4	100.0
Total	125	100.0	100.0	

Table 3 highlights that when considering education, the majority of respondents were college graduates (63.2%), with a significant percentage holding professional or graduate degrees (26.4%). These two education levels make up 89% of the respondents. Missing data was excluded from this table.

TABLE 3. Education.

Highest Level of Education Completed	Frequency	Percent	Valid Percent	Cumulative Percent
High school or equivalent	1	0.8	0.8	0.8
Some college	12	9.6	9.6	10.4
College graduate (BA, BS, AA)	79	63.2	63.2	73.6
Professional or graduate degree (Masters or Ph.D.)	33	26.4	26.4	100.0
Total	125	100.0	100.0	

Table 4 shows that concerning occupation data, an overwhelming number of respondents were scientists and engineers (72.6%), with some responses from administration/business professionals (13.7%), technicians (10.5%), and clerical personnel (3.2%). Missing data was excluded from this table.

TABLE 4. Occupation.

Occupation	Frequency	Percent	Valid Percent	Cumulative Percent
Administration/ business professional	17	13.7	13.7	13.7
Clerical	4	3.2	3.2	16.9
Scientist/engineer	90	72.6	72.6	89.5
Technician	13	10.5	10.5	100.0
Total	124	100.0	100.0	

JOB SATISFACTION ANALYSIS

Job Satisfaction Scale Questions and Frequencies

Table 5 lists the eight questions that measured job satisfaction, as well as the corresponding minimum, maximum, mean, and standard deviation. When analyzing the job satisfaction data, the scale ranged from 1 to 5, with 1 being "Definitely Yes" and 5 being "Definitely No." One exception is the last question, which has the four point scale listed with the question in the table. Missing data was excluded from this table.

TABLE 5. Job Satisfaction Scale Data.

	No.	Minimum	Maximum	Mean	Std. Deviation
I enjoy my job.	125	1	5	1.83	0.840
I have a lot of say over what happens in my job.	125	1	5	2.40	1.016
I can quickly access the information that I need for work.	125	1	5	2.74	0.985
I work more hours than a normal work week.	125	1	5	2.71	1.224
My job workload is high.	125	1	4	2.12	0.885
When computers are down, I cannot do my job.	125	1	4	1.62	0.840
I can count on the computer systems that I use being 'up' and available when needed.	124	1	5	2.36	1.007
Thinking about your job, on the whole, are you: 　1. Very Satisfied 　2. Somewhat Satisfied 　3. Somewhat Dissatisfied 　4. Very Dissatisfied	125	1	4	1.73	0.664

Table 6 shows the t-tests conducted on the eight Job Satisfaction questions. T-tests assess whether or not there is a statistical difference between the means of two groups (Reference 38). The Job Satisfaction t-test results are summarized in the table and include the degrees of freedom, the mean difference, and the 95% confidence interval. The first seven items had a test value of 3, which corresponds to the "Maybe" answer. The last item was tested versus a test value of 2.5, since that scale did not have a neutral value. Missing data was excluded from this table.

TABLE 6. Job Satisfaction–T-Test.

	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
	Lower	Upper	Lower	Upper	Lower	Upper
I enjoy my job.	-15.548	124	0.000	-1.168	-1.32	-1.02
I have a lot of say over what happens in my job.	-6.603	124	0.000	-0.600	-0.78	-0.42
I can quickly access the information that I need for work.	-2.997	124	0.003	-0.264	-0.44	-0.09
I work more hours than a normal work week.	-2.632	124	0.010	-0.288	-0.50	-0.07
My job workload is high.	-11.113	124	0.000	-0.880	-1.04	-0.72
When computers are down, I cannot do my job.	-18.413	124	0.000	-1.384	-1.53	-1.24
I can count on the computer systems that I use being 'up' and available when needed.	-7.047	123	0.000	-0.637	-0.82	-0.46
Thinking about your job, on the whole, are you: 1. Very Satisfied 2. Somewhat Satisfied 3. Somewhat Dissatisfied 4. Very Dissatisfied	-12.989	124	0.000	-0.772	-0.89	-0.65

Table 7 shows the results of Cronbach's alpha calculation for the eight Job Satisfaction questions. For questions 1 through 7, the scale ranged from 1 to 5, with 1 being "Definitely Yes" and 5 being "Definitely No." The Job Satisfaction questions for this scale calculation included the following:

1. I enjoy my job.
2. I have a lot of say over what happens in my job.
3. I can quickly access the information that I need for work.
4. I work more hours than a normal work week.
5. My job workload is high.
6. When computers are down, I cannot do my job.
7. I can count on the computer systems that I use being 'up' and available when needed.
8. Thinking about your job, on the whole, are you: 1. Very Satisfied, 2. Somewhat Satisfied, 3. Somewhat Dissatisfied, 4. Very Dissatisfied.

TABLE 7. Job Satisfaction Scale
Cronbach's Alpha.

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No. of Items
0.615	0.640	8

The calculation for Cronbach's alpha with this scale of eight items yielded a score of 0.62 for this measure. Although it is below the rule of thumb alpha value 0.7, the score indicates a reliable scale (Reference 39).

In Table 8, Cronbach's alpha was done analyzing the first item, "I enjoy my job," and the last item, "Thinking about your job, on the whole, are you: 1) Very Satisfied, 2) Somewhat Satisfied, 3) Somewhat Dissatisfied, or 4) Very Dissatisfied." This analysis resulted in Cronbach's alpha of 0.78, which indicates a highly reliable scale for these two items. These two questions focused on the job satisfaction of respondents with their jobs.

TABLE 8. Job Satisfaction–Two Item
Cronbach's Alpha.

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.778	0.791	2

JOB SATISFACTION SURVEY COMPARISON ANALYSIS

Comparing the results of this survey to the Danziger and Dunkle survey (Reference 13), their job satisfaction level was measured by the response to a single item: "Thinking about your job, on the whole, are you: very satisfied, somewhat satisfied, somewhat dissatisfied, or very dissatisfied." Their results showed 48% replying "very satisfied" and 40% replying "somewhat satisfied" with their job (Reference 13). In the present survey, 38%[*] of respondents replied they were "Very Satisfied," and 54% replied they were "Somewhat Satisfied" with their jobs. The Danziger and Dunkle survey (Reference 13), therefore, showed that 88% of respondents were at least satisfied with their jobs, while this survey found that 91% were at least satisfied with their jobs. The results from this study are shown in Table 9. Missing data was excluded from this table.

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[*] Within discussion, percentages are rounded to the nearest whole number.

TABLE 9. Job Satisfaction.

Thinking About Your Job, on the Whole, Are You	Frequency	Percent	Valid Percent	Cumulative Percent
Very Satisfied	47	37.6	37.6	37.6
Somewhat Satisfied	67	53.6	53.6	91.2
Somewhat Dissatisfied	9	7.2	7.2	98.4
Very Dissatisfied	2	1.6	1.6	100.0
Total	125	100.0	100.0	

NAVAIR IT PROCUREMENT ANALYSIS

NAVAIR IT Procurement Scale Questions and Frequencies

Table 10 illustrates the eight items measuring NAVAIR IT Procurement, including the minimum, maximum, mean, and standard deviation. When analyzing the NAVAIR IT procurement data, the scale ranged from 1 to 5, with 1 being "Definitely Yes" and 5 being "Definitely No."

TABLE 10. NAVAIR IT Procurement Scale Data.

	No.	Minimum	Maximum	Mean	Std. Deviation
I understand all of the steps in the NAVAIR IT procurement process.	124	1	6	3.98	1.262
If I don't understand a step in the NAVAIR IT procurement process, that information is readily available.	124	1	6	3.73	1.421
The NAVAIR IT procurement process is efficient.	123	1	6	4.43	1.064
The rules of the NAVAIR IT procurement process drive me to search for other methods to get the tools that I need.	124	1	6	2.41	1.514
I have all the IT software that I need to do my job.	124	1	6	3.58	1.183
I have all the IT hardware that I need to do my job.	124	1	6	3.44	1.205
I have created workarounds for IT software that I need but do not have.	124	1	6	2.79	1.327
I have created workarounds for IT hardware that I need but do not have.	124	1	6	2.80	1.331

Table 11 shows the t-tests conducted on the eight NAVAIR IT Procurement questions. The results are summarized in the table and include the t-test results, degrees of freedom, mean difference, and the 95% confidence interval. The items had a test value of 3, which corresponds to the "Maybe" answer. Missing data was excluded from the previous two tables.

TABLE 11. NAVAIR IT Procurement–T-Test. (One sample test.)

	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
I understand all of the steps in the NAVAIR IT procurement process.	8.680	123	0.000	0.984	0.76	1.21
If I don't understand a step in the NAVAIR IT procurement process, that information is readily available.	5.753	123	0.000	0.734	0.48	0.99
The NAVAIR IT procurement process is efficient.	14.912	122	0.000	1.431	1.24	1.62
The rules of the NAVAIR IT procurement process drive me to search for other methods to get the tools that I need.	-4.329	123	0.000	-0.589	-0.86	-0.32
I have all the IT software that I need to do my job.	5.465	123	0.000	0.581	0.37	0.79
I have all the IT hardware that I need to do my job.	4.099	123	0.000	0.444	0.23	0.66
I have created workarounds for IT software that I need but do not have.	-1.760	123	0.081	-0.210	-0.45	0.03
I have created workarounds for IT hardware that I need but do not have.	-1.687	123	0.094	-0.202	-0.44	0.04

Table 12 shows the results of Cronbach's alpha calculation for the following eight NAVAIR IT procurement questions. For questions 1 through 8, the scale ranged from 1 to 5, with 1 being "Definitely Yes" and 5 being "Definitely No."

1. I understand all of the steps in the NAVAIR IT procurement process.
2. If I don't understand a step in the NAVAIR IT procurement process, that information is readily available.

3. The NAVAIR IT procurement process is efficient.
4. The rules of the NAVAIR IT procurement process drive me to search for other methods to get the tools that I need.
5. I have all the IT software that I need to do my job.
6. I have all the IT hardware that I need to do my job.
7. I have created workarounds for IT software that I need but do not have.
8. I have created workarounds for IT hardware that I need but do not have.

TABLE 12. NAVAIR IT Procurement
Cronbach's Alpha.

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No. of Items
0.515	0.520	8

The Cronbach's alpha calculation for this measure yielded a score of 0.52, indicating that the items were not a highly reliable scale. The lenient cutoff for exploratory research of 0.60 was not achieved in this case (Reference 40). Some of this inconsistency may have been caused by a few bad survey items, which helped to lower the overall Cronbach's alpha score. The average intercorrelation of items here was not as strong as it would be with an established instrument. The questions used for this scale were designed by the researcher and are not a fully validated instrument. Any bias or other limitations have not been removed from the questions administered.

CROSS TABULATION DATA

Work Experience versus IT Approval Training

Table 13 shows this study's Work Experience versus IT Approval Training data. The data fields were combined to create three main subsets of experience (0 to 5, 6 to 15, and 16 to 21 plus years). Within these three work experience groups, 78, 84, and 72% of respondents, respectively, indicated they had either not taken or did not know about the IT training. Those figures combined the "No" answers into a single overall "No" category. From an efficiency standpoint, providing every end user with IT approval process training is unnecessary; however, this study shows that 60, 47, and 24% of respondents, respectively, did not even know that IT approval training exists. These numbers indicate an overall lack of awareness for IT-related information across the whole range of work experience categories.

TABLE 13. Work Experience versus IT Approval Training Cross Tabulation.

Years of Work Experience for NAWCWD		Have You Taken the IT Approval Training Class?			Total
		Yes	No (Did Not Know About IT Training)	No (Knew About IT Training But Didn't Take It)	
0 to 5	Count	8	22	7	37
	% within years of work experience for NAWCWD	21.6	59.5	18.9	100.0
6 to 15	Count	7	20	16	43
	% within years of work experience for NAWCWD	16.33	46.5	37.2	100.0
16 to 21+	Count	20	11	14	45
	% within years of work experience for NAWCWD	44.4	24.4	31.1	100.0
Total	Count	35	53	37	125
	% within years of work experience for NAWCWD	28.0	42.4	29.6	100.0

The stacked bar graph in Figure 13 shows Work Experience versus IT Approval Training data, this time breaking the respondents down into six work experience groups (less than 1, 1 to 5, 6 to 10, 11 to 15, 16 to 20, and 21 plus years). In this graph, the lack of awareness for this training class across the whole range of work experience categories is apparent. Since only a small subset of the entire population would need the IT approval training to help improve overall process efficiency, these results merit further study with a greater focus on the general awareness of available IT-related resources.
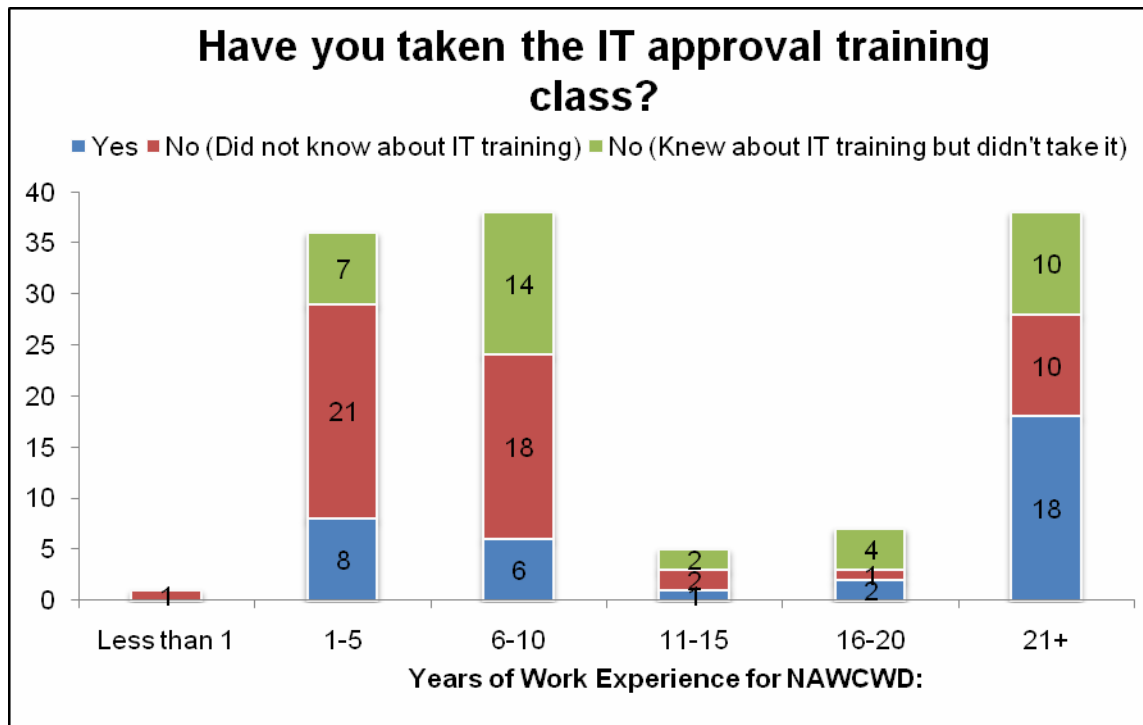
FIGURE 13. Work Experience versus IT Approval Training.

Table 14 shows the chi-square calculation of the Work Experience versus IT Approval Training data. A chi-square critical values chart was used from the Appendix of D. P. Doane and L. E. Seward's *Applied Statistics in Business and Economics* (Reference 41). The Pearson chi-square is $p < 0.001$, so the probability level is less than 1 in 1,000. A chi-square value of 14.86 occurs only once in 1,000 samples. Therefore, the value of 15.43 makes this probability statistically significant. This result means that we accept the null hypothesis that there is no relationship between work experience and having taken the IT approval training class. In other words, we can conclude that no relationship exists between work experience and IT approval training.

TABLE 14. Work Experience versus IT Approval Training Chi-Square Tests.

	Value	df	Asymp. Sig. (2-sided)
Pearson chi-square	15.428[a]	4	0.004
Likelihood ratio	15.666	4	0.004
Linear-by-linear association	0.556	1	0.456
No. of valid cases	125		

[a]0 cells (0.0%) have expected count less than 5. The minimum expected count is 10.36.

Work Experience versus IT Software Workarounds

Table 15 shows the correspondence of Work Experience versus end user IT Software Workarounds. The data fields were combined here to create three main subsets of work experience (0 to 5, 6 to 15, and 16 to 21 plus years). Focusing on these three groups, 52, 54, and 51%, respectively, answered either "Definitely Yes" or "Yes" to the statement, "I have created workarounds for IT software that I need but do not have." In comparison, 24, 26, and 50% of respondents answered "Definitely No" or "No" to this question. Missing data was excluded from this table, as well as the "Don't Know" answers.

TABLE 15. Work Experience versus IT Software Workarounds.

Years of Work Experience for NAWCWD		I Have Created SW Workarounds			Total
		Yes	Maybe	No	
0 to 5	Count	17	8	8	33
	% within years of work experience for NAWCWD	51.5	24.2	24.2	100.0
6 to 15	Count	23	9	11	43
	% within years of work experience for NAWCWD	53.5	20.9	25.6	100.0
16 to 21+	Count	22	3	18	43
	% within years of work experience for NAWCWD	51.2	7.0	41.9	100.0
Total	Count	62	20	37	119
	% within years of work experience for NAWCWD	52.1	16.8	31.1	100.0

Figure 14 provides a bar graph comparing the Work Experience and IT Software Workarounds data. Across all of the work experience categories, the implementation of IT software workarounds is apparent. These numbers may highlight the feelings from the general end user that they do not have all of the IT software tools needed when using the

system currently in place for procurements, which in turn leads them to look into other workarounds to get their jobs accomplished. These answers may merit further investigation in the future to discover specifically what IT software workarounds are being implemented.

FIGURE 14. Work Experience versus IT Software Workarounds.

Table 16 shows the chi-square calculation of the Work Experience versus IT Software Workaround data. A chi-square critical values chart was used as in previous calculations (Reference 41). With a chi-square value of 6.54, we fail to reject the null hypothesis that there is no relationship between work experience and creating IT software workarounds at the 5% or lower level of significance. It appears that there is a relationship between work experience and IT software workarounds at a weaker statistical significance level.

TABLE 16. Work Experience versus IT Software Workarounds Chi-Square Tests.

	Value	df	Asymp. Sig. (2-sided)
Pearson chi-square	6.540[a]	4	0.162
Likelihood ratio	6.992	4	0.136
Linear-by-linear association	0.844	1	0.358
No. of valid cases	119		

[a]0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.55.

Work Experience versus IT Hardware Workarounds

The numbers in Table 17 comparing Work Experience and IT Hardware Workarounds are comparable to the IT Software Workaround data. The data fields were combined again here to create three main subsets of work experience (0 to 5, 6 to 15, and 16 to 21 plus years). For the three work experience groups, 42, 61, and 51% of respondents answered either "Definitely Yes" or "Yes" to the statement "I have created workarounds for IT hardware that I need but do not have." In comparison, 30, 23, and 42% answered "Definitely No" or "No."

TABLE 17. Work Experience versus IT Hardware Workarounds.

Years of Work Experience for NAWCWD		I Have Created HW Workarounds			Total
		Yes	Maybe	No	
0 to 5	Count	14	9	10	33
	% within years of work experience for NAWCWD	42.4	27.3	30.3	100.0
6 to 15	Count	26	7	10	43
	% within years of work experience for NAWCWD	60.5	16.3	23.3	100.0
16 to 21+	Count	22	3	18	43
	% within years of work experience for NAWCWD	51.2	7.0	41.9	100.0
Total	Count	62	19	38	119
	% within years of work experience for NAWCWD	52.1	16.0	31.9	100.0

The bar graph in Figure 15 illustrates the Work Experience versus IT Hardware Workarounds data. These results are again similar to the IT software workaround data. When looking at workers with 1 to 10 years of experience, the need for IT hardware workarounds is particularly apparent. As with software workarounds, respondents' answers to the hardware question may indicate that the general end user feels he or she

does not have all of the IT hardware tools necessary when using the current procurement system, which in turn leads to the use of workarounds to accomplish jobs. This may merit further investigation in the future to determine what these workarounds truly are.
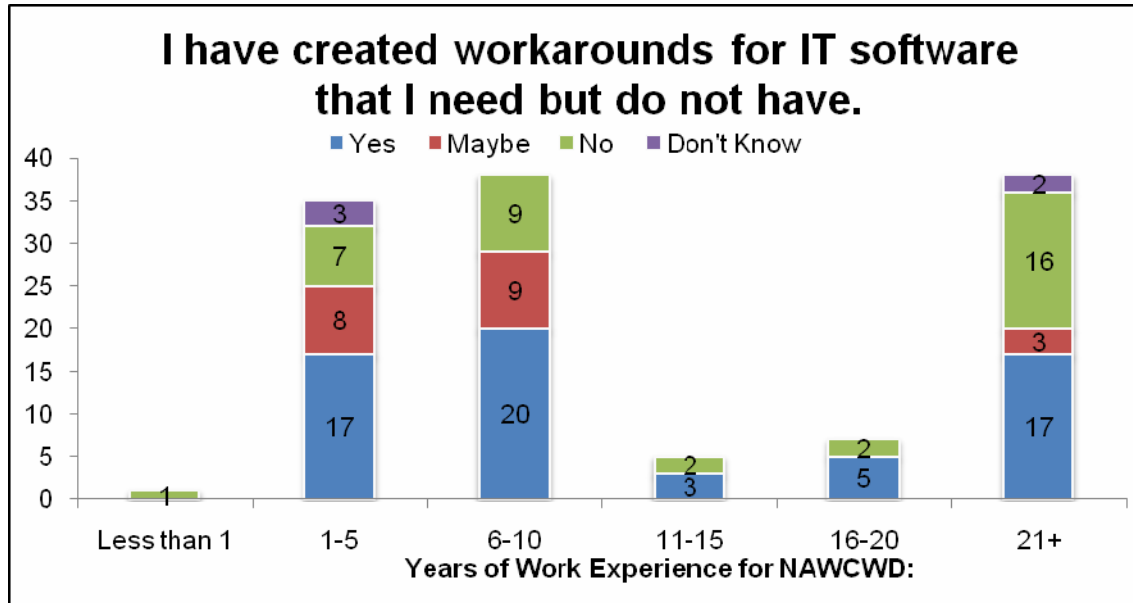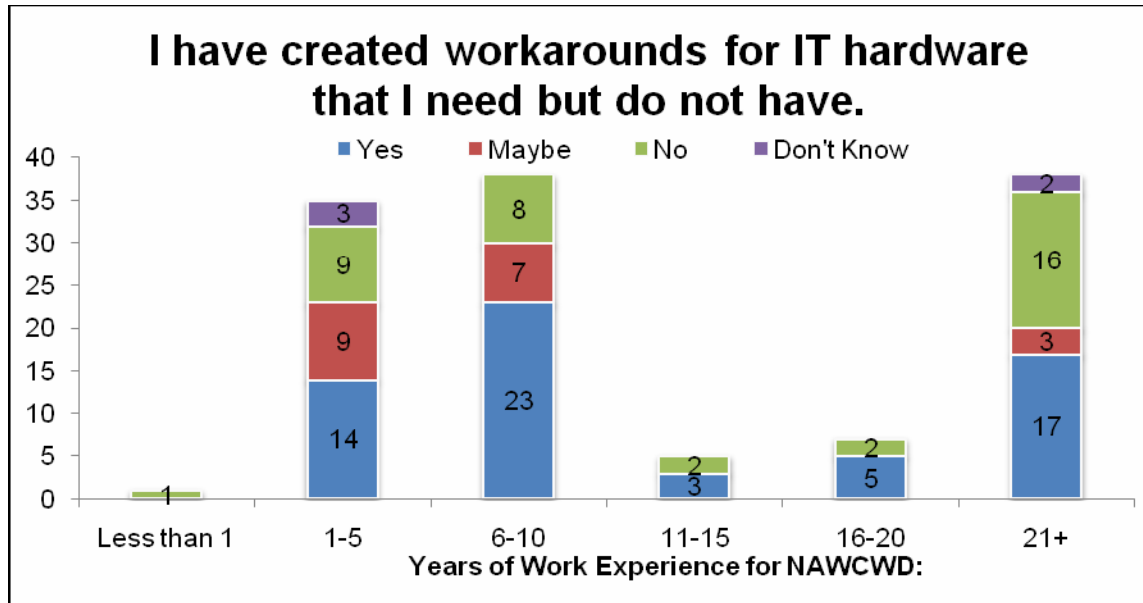

FIGURE 15. Work Experience versus IT Hardware Workarounds.

Table 18 shows the chi-square calculation of the Work Experience versus IT Hardware Workaround data. A chi-square critical values chart was used as in previous calculations (Reference 41). With a chi-square value of 8.37, we fail to reject the null hypothesis that there is no relationship between work experience and creating IT hardware workarounds at the 5% or lower level of significance. However, the relationship is statistically significant at a 10% level. As such, it appears there is a relationship between work experience and IT hardware workarounds at a weaker statistical significance level. Therefore, we can conclude that a weak relationship exists between work experience and IT hardware workarounds.

TABLE 18. Work Experience versus IT Hardware Workarounds Chi-Square Tests.

	Value	df	Asymp. Sig. (2-sided)
Pearson chi-square	8.367[a]	4	0.079
Likelihood ratio	8.487	4	0.075
Linear-by-linear association	0.067	1	0.796
No. of valid cases	119		

[a]0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.27.

IT Software Needed versus IT Software Workarounds

Table 19 is a cross tabulation comparing IT Software Needed versus IT Software Workarounds. Within this data, when users answered "No" to the statement, "I have all the IT software that I need to do my job" cross tabulated with answering "Yes" to the statement, "I have created workarounds for IT software that I need but do not have," 68% of the respondents showed they were trying to accomplish their jobs lacking the correct tools. At the opposite end of the spectrum, 71% of respondents answered that when they have all the software they need, they have not created software workarounds. This indicates that end users are forced to find alternate means to get their jobs accomplished when they do not have the correct IT software tools.

TABLE 19. IT Software Needed versus IT Software Workarounds.

I Have All the SW That I Need		I Have Created SW Workarounds			Total
		Yes	Maybe	No	
Yes	Count	5	3	20	28
	% within "I have all the SW That I Need"	17.9	10.7	71.4	100.0
Maybe	Count	13	4	9	26
	% within "I have all the SW That I Need"	50.0	15.4	34.6	100.0
No	Count	44	13	8	65
	% within "I have all the SW That I Need"	67.7	20.0	12.3	100.0
Total	Count	62	20	37	119
	% within "I have all the SW That I Need"	52.1	16.8	31.1	100.0

Figure 16 shows a bar graph comparing the IT Software Needed and IT Software Workaround data. Information on the specific workarounds used was not collected in this study. However, meaningful data regarding the workarounds in place for alternative IT software solutions would help determine whether or not the issues are systemic to the IT procurement process.

FIGURE 16. IT Software Needed versus IT Software Workarounds.

Table 20 shows the chi-square calculation of the IT Software Needed versus IT Software Workaround data. A chi-square critical values chart was used as in previous calculations (Reference 41). The Pearson chi-square is $p < 0.001$, so the probability level is less than 1 in 1,000. A chi-square value of 14.86 would only happen once in 1,000 samples. The value of 32.53 makes this probability statistically significant. This result means that we reject the null hypothesis that there is no relationship between IT software needed and using IT software workarounds.

TABLE 20. IT Software Needed versus IT Software Workarounds Chi-Square Tests.

	Value	df	Asymp. Sig. (2-sided)
Pearson chi-square	32.533^a	4	0.000
Likelihood ratio	32.748	4	0.000
Linear-by-linear association	28.860	1	0.000
N of valid cases	119		

^{a}2 cells (22.2%) have expected count less than 5. The minimum expected count is 4.37.

IT Hardware Needed versus IT Hardware Workarounds

Table 21 compares IT hardware workarounds to end users' feelings that they have all the IT hardware that they need to do their jobs. Within this data, of the respondents answering "No" to the statement, "I have all the IT hardware that I need to do my job," 76% went on to answer "Yes" to the statement, "I have created workarounds for IT hardware that I need but do not have." This indicates that end users are forced to find alternate means to get their jobs accomplished because they do not have the correct IT hardware tools. When looking at this data, and taking into account that the IT software question had a 68% response rate as well, the need for additional research regarding this issue becomes more apparent.

TABLE 21. IT Hardware Needed versus IT Hardware Workarounds.

I Have All the HW That I Need		I Have Created HW Workarounds			Total
		Yes	Maybe	No	
Yes	Count	6	2	25	33
	% within "I have all the HW That I Need"	18.2	6.1	75.8	100.0
Maybe	Count	14	10	7	31
	% within "I have all the HW That I Need"	45.2	32.3	22.6	100.0
No	Count	42	7	6	55
	% within "I have all the HW That I Need"	76.4	12.7	10.9	100.0
Total	Count	62	19	38	119
	% within "I have all the HW That I Need"	52.1	16.0	31.9	100.0

The bar graph in Figure 17 illustrates the IT Hardware Needed versus IT Hardware Workaround data. When users answered "No" to the question "I have all the IT hardware that I need to do my job" cross tabulated with answering "Yes" to the "I have created workarounds for IT hardware that I need but do not have," 68% of the respondents showed that they were trying to accomplish their jobs lacking the correct tools. Information on the types of workarounds being used was not collected. Meaningful data regarding the workarounds in place for alternative IT hardware solutions would help in determining whether or not the issues are systemic to the IT procurement process.
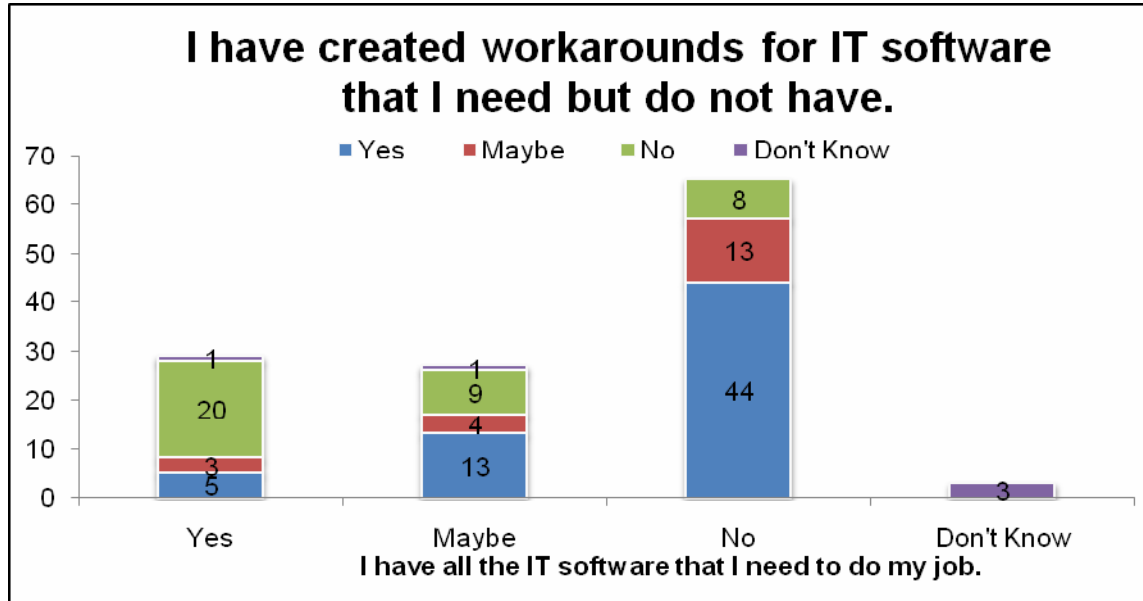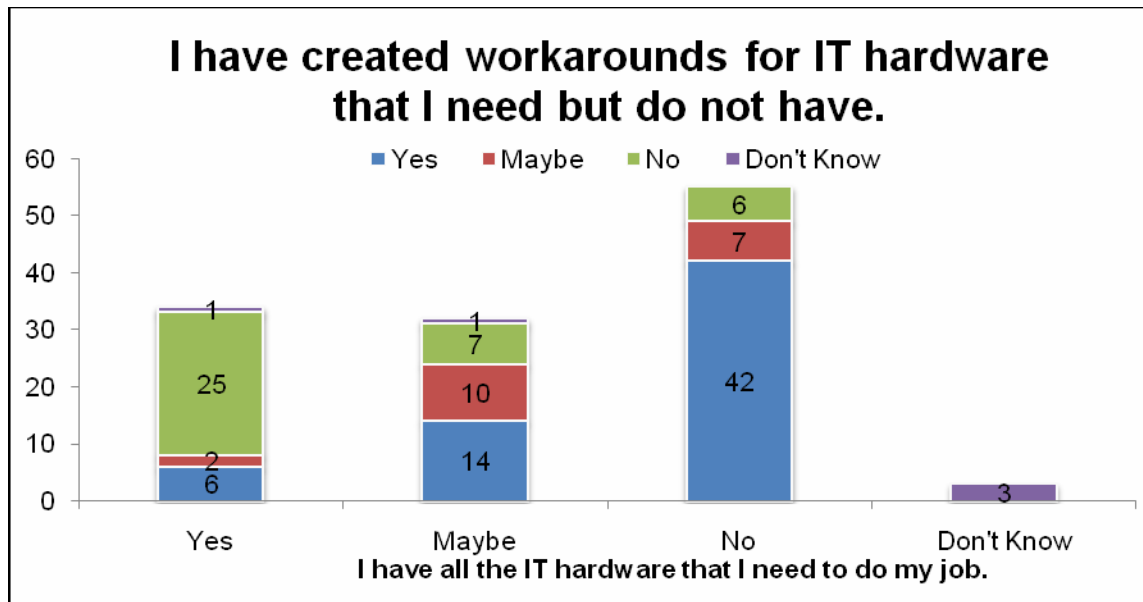

FIGURE 17. IT Hardware Needed versus IT Hardware Workarounds.

Table 22 shows the chi-square calculation of the IT Hardware Needed versus IT Hardware Workaround data. A chi-square critical values chart was used as in previous calculations (Reference 41). The Pearson chi-square is $p < 0.001$, so the probability level is less than 1 in 1,000. A chi-square value of 14.86 would only happen once in 1,000 samples. Therefore, the value of 49.64 makes this probability statistically significant. This result means that we reject the null hypothesis that there is no relationship between IT hardware needed and using IT hardware workarounds.

TABLE 22. IT Hardware Needed versus IT Hardware Workarounds Chi-Square Tests.

	Value	df	Asymp. Sig. (2-sided)
Pearson chi-square	49.641^a	4	0.000
Likelihood ratio	47.952	4	0.000
Linear-by-linear association	37.771	1	0.000
No. of valid cases	119		

[a]1 cell (11.1%) has expected count less than 5. The minimum expected count is 4.95.

CONCLUSIONS

After analyzing the results, a few areas of concern were highlighted. First, there is a general lack of awareness among the respondents regarding available IT resources, as well as confusion regarding the processes currently in place. There are many steps in the total IT procurement process, which contributes to some of the confusion for end users. Some resources, such as the existence of the IT Approval training class, are not in the general sphere of knowledge for most users. Additionally, points of contact for the various phases in the process are not readily found, leading to confusion over what the next step should be. Although not everyone must be trained in navigating the process, the knowledge that it is there, and where one can go for it, should be readily available.

Secondly, the IT hardware and software workarounds end users implement to accomplish their jobs should be investigated in greater depth. Although the IT procurement process can add layers of complexity to the process, it is not meant to be a roadblock that users feel they need to circumvent. Thus, if end users feel they are not able to get the tools they need to accomplish their jobs within the current system, this problem needs to be addressed. NAVAIR's overall procurement process has many steps; however, it is comparable to the processes implemented in industry, processes which also have many steps to follow. The IT/IM Department needs to follow the overall IT guidelines for NAVAIR, so any changes will need to be made with that compliance in mind.

This study did not collect information on the actual workarounds implemented by end users. Therefore, further analysis in a follow-on case study could focus on this work to get to the root of the problem. The problems could be a misunderstanding regarding the process a user needs to go through, or it could be a systemic issue that hasn't been currently addressed. Overall, however, there seems to be a great deal of confusion with end users regarding what the IT procurement process is versus other issues that are not part of the process at all, such as NMCI services.

DISCUSSION AND CONCLUSION

SUMMARY OF FINDINGS

The results of this study were based upon the responses of 126 end users at NAWCWD China Lake. The results show that most of the respondents were fairly satisfied with their jobs but were unsatisfied with the NAVAIR IT procurement process. Further, there is a lack of awareness of available IT resources and a general confusion about the IT process itself versus other processes. On a larger scale, the IT software and hardware workarounds in use help to highlight the perception that the current process is a roadblock to workers, rather than a necessary step in the larger picture.

CASE STUDY COMPARISON

The Danziger and Dunkle case study (Reference 13) measured job satisfaction with the response to a single item: "Thinking about your job, on the whole, are you: very satisfied, somewhat satisfied, somewhat dissatisfied, or very dissatisfied." Their survey involved a sub-sample from 1200 individuals in twelve MSAs (Reference 13). The results from their large sub-sample showed that 48% replied they were very satisfied, while 40% replied they were somewhat satisfied with their job. In comparison, in the NAWCWD China Lake survey, 38% of respondents were very satisfied, and 54% were somewhat satisfied with their jobs.

IMPLICATIONS FOR FUTURE RESEARCH

The NAVAIR IT procurement process plays an important role in providing the tools NAWCWD China Lake workers use to do their jobs. This initial case study set out to be a first step in defining the processes currently in place. The background work involved identifying all of the various steps in the procurement process, which helped in the creation of the Software Approval Process and Purchase flow charts (Figures 4 and 5). When comparing the steps in NAVAIR's process to those used in industry, it is apparent that the processes for larger companies are similar to the NAVAIR process.

Future studies should focus on the following three areas: (1) Content and accessibility of IT-related information, (2) IT software workaround issues, and (3) IT hardware workaround issues. These three issues themselves could be the focus of future work. However, getting to the root of everything could be problematic, since end users may be hesitant to reveal the workarounds they are actually using. For example, a small lab that is off the formal IT awareness grid would not like to lose their productivity and machines with the formal processes that would be placed upon them. Although most users know what problems they have with the system currently in place, instituting a

solution would involve putting them at risk of exposure and of becoming a part of the process itself.

When looking at the first possible focus area, IT content and accessibility, it is apparent that end users are confused with the process and do not know where to look for answers. As the flow charts in this case study show, the IT procurement process itself has many steps, and the links between the steps, as well as the various points of contact, are not easily found.

When new users are confronted with the task of starting an IT approval, they end up becoming overwhelmed with the depth of information available. Full instruction sets are available on the IT Approval site, but a quick how-to guide is missing, and the interconnected nature of the process is not readily apparent. Currently, improvements to the IT Approval portal on the Wingspan webpage are underway.

A future study initiative could also focus entirely on the workarounds being implemented with hardware. Although not specifically investigated within this case study, one possible concern could be users clinging to out-of-date hardware with fears that a replacement will be too difficult to acquire. Such a problem may be a concern because of the possible detriment it could pose to overall workforce productivity. This is just one of many possible issues that only a follow-on effort specifically focused on hardware workarounds could resolve.

With software workarounds, the actual methods employed should also be investigated. The present lack of knowledge concerning software workarounds is hindering the opportunity for fixes that could alleviate the root problem. Thus, understanding the exact methods used could help correct the problems that exist while highlighting the current procedures in place, procedures that are intended to provide the right tools to the right users.

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Appendix A

SURVEY E-MAIL

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From: Tajii, Kevin CIV
To: Tajii, Kevin CIV
Cc: Storch, Mark CAPT NAWCWD, 0.0; Weed, Scott CIV NAVAIR;
          Kolstoe, Mark NAVAIR, 726000D; Dr. Tarique Hossain
Sent: Thu Mar 18 07:38:17 2010
Subject: NAWCWD Survey

NAWCWD Employees selected for independent survey:

I am Kevin Tajii, conducting an independent NAVAIR IT Environment survey as a part of my NAWCWD duties. I am conducting this survey in coordination with the Code 7.2 IT/IM Department Head, Scott Weed, and with the approval of the Command Information Assurance Manager (IAM), Mark Kolstoe, Code 7.2.6.

The Commander, NAWCWD, Captain Mark Storch, has given approval to take this survey using official time, and his Memorandum for Record email has been attached. The data that will be collected will be aggregated in total and submitted in a report to Code 7.2. Individual responses and respondents will not be tracked.

Below is a non-NAWCWD, commercial link authorized specifically for the purposes of this independent survey only. If you have any questions about the survey please contact me or if you have questions about the validity of this e-mail or link please contact the Command IAM, Mark Kolstoe at xxx-xxxx.

http://www.zoomerang.com/Survey/WEB22A7EB3BSSP

Thank you for your participation.
Kevin Tajii
Code 545300D
(xxx)xxx-xxxx

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Appendix B

MEMORANDUM FOR RECORD

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From: Storch, Mark CAPT NAWCWD, 0.0
Sent: Thursday, February 25, 2010 11:21
To: Tajii, Kevin CIV; Douglas, Barry CIV NAVAIRWARCENWPNDIV
400000D; Ford, Kevin P CIV NAWCWD
Cc: Burnett, Marci CIV NAVAIRWARCENWPNDIV 500000D; O'Neil, Scott
NAVAIR; Atienzamoore, Therese M CIV; Weed, Scott CIV NAVAIR;
McCollum, John COUNSEL; Lochhead, Larry CIV NAVAIR N60530
Subject: NAWCWD Surveys

Memorandum for Record.

I authorize the following three individuals, to survey NAWCWD employees using
official time. Barry Douglas (400000D), Kevin Ford (474200D), and Kevin Tajii
(545300D) are working projects for NAWCWD in conjunction with graduate studies at
Cal Poly Pomona. Mr. Douglas' project, Invoking Methodological Triangulation to
establish a Rapid War Fighting Response (RWR) Organization for the Naval Air Warfare
Center Weapons Division (NAWCWD), is being conducted for Mr. Scott O'Neil the
Weapons Division Executive Director. Kevin Ford's project, Proposed Methodology to
Obtain Science and Technology Funding in the Government, specifically at the Naval Air
Warfare Center Weapons Division, is for Ms. Therese Atienzamoore the Energetics
Research Division Head. Kevin Tajii's project, NAVAIR IT Environment Survey, is for
Mr. Scott Weed the Deputy for Information Technology and Information Management
Department. Each project has a requirement to survey NAWCWD employees to obtain
primary research data.

Mr. Douglas plans to recruit 325 WD employees, Kevin Ford intends to recruit 100, and
Kevin Tajii will recruit 300. The surveys are expected to take from 15 to 30 minutes.
Participation is voluntary and responses are absolutely confidential.

Information obtained from the survey questions will be collected and maintained as
confidential data. The data will be aggregated, analyzed, and written up for each
respective Department/Division Head. In my case, the aggregated data and subsequent
report will be provided to Mr. O'Neil, Kevin Ford will provide results to Therese
Atienzamoore, and Kevin Tajii to Scott Weed. The data will be destroyed upon
completion and submission of our projects.

Although I am able to approve the survey to meet a command necessity, I am unable to
approve the survey being done for the purpose of meeting your personal educational
requirements, at this time. Should NAWCWD be able to enter into a current EPA with
Cal Pomona, I may then be able to approve the survey to meet an objective of the EPA.

Unless and until I am able to do so, you must obtain the data, utilizing the FOIA process as a private citizen, prior to using it for your educational pursuits.

Vr, Mark
CAPT Mark Storch, USN
Acting Commander
NAWC Weapons Division
xxx.xxx.xxxx China Lake
xxx.xxx.xxxx Point Mugu
xxx.xxx.xxxx Cellular

Appendix C

IRB APPROVAL LETTER

(The contents of this appendix are reproduced in facsimile.)

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State of California

Memorandum

California State Polytechnic University, Pomona
Office of Research

Date: March 15, 2010

To: Kevin Tajii
Business Administration

From: Dr. David M. Adams
Chair, IRB (Human Subjects Protection Committee)

cc: IRB file
Tarique Hossain PhD

Subject: Protocol number 10-027

Your *de novo* protocol entitled "NAVAIR Information Technology Procurement Process Related to Job Satisfaction Case Study" has been reviewed by the Cal Poly Pomona Institutional Review Board (IRB) by the **expedited** process. It was found to be in compliance with applicable federal and state regulations and Cal Poly Pomona policies regarding the protection of human subjects used in research. Thus, the Cal Poly Pomona IRB grants you approval to conduct the research. On its behalf, I thank you for your adherence to established policies meant to ensure the safety and privacy of your study participants. You may wish to keep a copy of this memo with you while conducting your research project.

You may initiate the project as of March 15, 2010, and it must be completed by March 14, 2011. Federal regulations limit the IRB approval of studies for up to one year. If you find the need to renew your protocol, please remember to submit a request to the IRB at least six (6) weeks before this end date to ensure continuous human subjects' protection and IRB approval. It would be appreciated that you advise the IRB upon the completion of your project involving the interaction with human subjects.

Note: confirmation is needed that Dr. Andy Jones of the Department of the Navy, representing human subjects protections, has seen and acknowledged the Cal Poly IRB approval of your research.

Approval is conditional upon your willingness to carry out your responsibilities as the principal investigator under University policy. Your research project must be conducted according to the methods described in the final approved protocol. Should there be any changes to your research plan as described, please advise the IRB, because you may be required to submit an amendment. Additionally, should you as the investigator or any of your subjects experience any "problems which involve an undescribed element of risk" (adverse events in regulatory terms), please immediately inform the IRB of the circumstances.

If you need further assistance, you are encouraged to contact the IRB administrator, Bruce W. Kennedy MS RLATG CMAR CPIA at 909-869-4215.

The committee wishes you success in your research endeavors.

David M. Adams PhD MLS (law)
Professor, Philosophy
Chair, Department of Philosophy
College of Letters, Arts, and Social Sciences
Director, Institute for Ethics and Public Policy

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Appendix D

OFFICE OF NAVAL RESEARCH APPROVAL LETTER

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From: Jones, Andy
To: Tajii, Kevin CIV
Date: Wed, Mar 17, 2010 at 9:47 PM
Subject: Re: Fw: IRB Application - NAVAIR IT, #10-027
Classification: Personal

Mr. Tajii,

I have reviewed the proposed research titled "NAVAIR Information Technology Process Related to Job Satisfaction Case Study." This study appears to meet Department of the Navy requirements for human subjects research as required in 32 CFR 219, DoD Directive 3216.02, and SECNAVINST 3900.39D. Accordingly, you are authorized to conduct this research as stipulated in the Cal Poly Pomona IRB approval.

Retain a copy of this email as documentation of this determination. Good luck with your research.

Andrew Jones, Ph.D., CIP
Research Protections Manager
Department of the Navy
Human Research Protection Program
Office of Naval Research
875 North Randolph St.
Arlington, VA 22203
xxx-xxx-xxxx

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Appendix E

SURVEY QUESTIONS

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NAVAIR IT Environment Survey

IRB Information
California State Polytechnic University, Pomona
Informed Consent Form for Research Involving Human Subjects

You are being invited to participate in a research study, which the Cal Poly Pomona Institutional Review Board (IRB) has reviewed and approved for conduct by the investigators named here. This form is designed to provide you - as a human subject - with information about this study. The Investigator or his/her representative will describe this study to you and answer any of your questions. You are entitled to an Experimental Research Subject's Bill of Rights and a copy of this form. If you have any questions or complaints about the informed consent process of this research study or your rights as a subject, please contact the Compliance Office within Cal Poly Pomona's Office of Research and Graduate Studies at (909) 869-4215.

Dear Participant,

I am Kevin Tajii, a Master's of Business Administration (MBA) student taking classes through the California State Polytechnic University, Pomona campus. I am a full-time NAWCWD-China Lake employee, who is looking to complete my final project for this degree. I am inviting you to participate in a study I am conducting for my final research project.

The purpose of the study is to find out your feelings regarding the Information Technology (IT) procurement process for NAVAIR. The NAVAIR implementation of the IT Approval process is used for the approval of Non-NMCI hardware and software, as seen on the CIO webpage of Wingspan. https://mynavair.navair.navy.mil/cio/

This study will explore your knowledge of the NAVAIR IT procurement process, and look for ways to improve upon it. Anyone who works for NAVAIR that has dealt with the IT procurement process is eligible to participate.

If you volunteer to be in this study, you will be asked to complete a survey. This should take less than 20 minutes of your time. The questions concern your experiences with the current NAVAIR IT procurement process, as well as your understanding of it.

Participation in the study is completely voluntary. If you agree to participate, you can still withdraw from the study at any time. All of your answers are important, and I hope that you answer all of the questions and provide any feedback that you feel is important.

There are no risks involved in participation in this study. Your responses are anonymous as no name or other personally identifiable information will be collected with this study. There is no risk of being identified in the research findings which will be reported at the group or aggregate level. The information reported will reflect many people's answers about the NAVAIR IT procurement process, and individuals cannot be identified.

1) Informed Consent Answer: By answering yes, you are consenting to participate in this survey.

      Yes
      No

Demographic Information

2) Employment:
      Full-time NAWCWD employee
      Part-time NAWCWD employee
      Contractor
      Military
      NAWS employee

3) Years of work experience for NAWCWD:
      Less than 1
      1-5
      6-10
      11-15
      16-20
      21+

4) Highest level of education completed:
      Less than High School Degree
      High School or Equivalent
      Some College
      College Graduate (BA, BS, AA)
      Professional or Graduate Degree (Masters or PhD)

5) Occupation:
      Administration/Business Professional
      Clerical
      Scientist/Engineer
      Technician

QUESTIONS

6) How many hours do you use a computer per week at work?
      0-5
      6-10
      11-15
      16-20
      21-25
      26-30
      31-35
      36-40
      40+

7) How many hours do you use NAVAIR IT procured hardware/software (non-NMCI) to perform your job per week?

    0-5
    6-10
    11-15
    16-20
    21-25
    26-30
    31-35
    36-40
    40+

8) Work Environment Questions

	Definitely Yes	Yes	Maybe	No	Definitely No
I enjoy my job.					
I have a lot of say over what happens in my job.					
I can quickly access the information that I need for work.					
I work more hours than a normal work week.					
My job workload is high.					
When computers are down, I cannot do my job.					
I can count on the computer systems that I use being 'up' and available when needed.					

9) Thinking about your job, on the whole, are you:

    Very Satisfied
    Somewhat Satisfied
    Somewhat Dissatisfied
    Very Dissatisfied

NAVAIR IT Procurement Questions

10) How many times in the past year have you procured an item through the NAVAIR IT procurement process? Do NOT include orders placed at your request by someone else in your organization (i.e., you delegated the task).

    0
    1-2
    3-5
    6-10
    11 or more
    I have never used the process

11) How would you describe the NAVAIR IT procurement process? (Check all that apply)

So daunting I am afraid to even learn the process.
Complicated and almost impossible to learn the process.
Like anything else, you just need to follow the steps.
Fairly straightforward and intuitive.
So easy anyone can follow the process.

12) Have you taken the IT approval training class?

Yes
No (Did not know about IT training)
No (Knew about IT training but didn't take it)

13) Do you use a support team for your NAVAIR IT approvals? (i.e., you delegated the IT Approval task).

Yes
No
Don't know

14) NAVAIR IT Procurement Process Questions

	Definitely Yes	Yes	Maybe	No	Definitely No	Don't Know
I understand all of the steps in the NAVAIR IT procurement process.						
If I don't understand a step in the NAVAIR IT procurement process, that information is readily available.						
The NAVAIR IT procurement process is efficient.						
The rules of the NAVAIR IT procurement process drive me to search for other methods to get the tools that I need.						
I have all the IT software that I need to do my job.						
I have all the IT hardware that I need to do my job.						
I have created workarounds for IT software that I need but do not have.						
I have created workarounds for IT hardware that I need but do not have.						

15) Considering your LAST order, from the time you decided which item to buy until your completed and approved paperwork was delivered to the buyer, how many hours did it take you to complete the NAVAIR IT procurement process? Do NOT include the time you spent researching what to buy or the time it took the vendor to deliver the product.
      1-4
      5-10
      11-15
      16-20
      21 or more
      Not Applicable

16) What was the cost of your last purchase through the NAVAIR IT procurement process?
      $0 to $2,999
      $3,000 to $9,999
      $10,000 to $24,999
      $25,000 to $49,999
      $50,000 to $99,999
      Greater than $100,000

17) Comments
      _____

Thank you for participating in this survey.

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Appendix F

SURVEY DATA

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1. Informed Consent Answer: By answering yes, you are consenting to participate in this survey.		
Yes	126	98%
No	2	2%
Total	**128**	**100%**

2. Employment:		
Full-time NAWCWD employee	122	98%
Part-time NAWCWD employee	0	0%
Contractor	3	2%
Military	0	0%
NAWS employee	0	0%
Total	**125**	**100%**

3. Years of work experience for NAWCWD:		
Less than 1	1	1%
1-5	36	29%
6-10	38	30%
11-15	5	4%
16-20	7	6%
21+	38	30%
Total	**125**	**100%**

4. Highest level of education completed:		
Less than High School Degree	0	0%
High School or Equivalent	1	1%
Some College	12	10%
College Graduate (BA, BS, AA)	79	63%
Professional or Graduate Degree (Masters or PhD)	33	26%
Total	**125**	**100%**

5. Occupation:		
Administration/Business Professional	17	14%
Clerical	4	3%
Scientist/Engineer	90	73%
Technician	13	10%
Total	**124**	**100%**

6. How many hours do you use a computer per week at work (NMCI and RDT&E)?

0-5	2	2%
6-10	6	5%
11-15	5	4%
16-20	6	5%
21-25	13	10%
26-30	21	17%
31-35	23	18%
36-40	31	25%
40+	18	14%
Total	125	100%

7. How many hours do you use NAVAIR IT procured hardware/software (non-NMCI) to perform your job per week?

0-5	32	26%
6-10	11	9%
11-15	10	8%
16-20	10	8%
21-25	14	11%
26-30	15	12%
31-35	14	11%
36-40	14	11%
40+	5	4%
Total	125	100%

8. Work Environment Questions

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	Definitely Yes	Yes	Maybe	No	Definitely No
I enjoy my job.	48 / 38%	57 / 46%	14 / 11%	5 / 4%	1 / 1%
I have a lot of say over what happens in my job.	24 / 19%	48 / 38%	36 / 29%	13 / 10%	4 / 3%
I can quickly access the information that I need for work.	10 / 8%	45 / 36%	44 / 35%	20 / 16%	6 / 5%
I work more hours than a normal work week.	26 / 21%	29 / 23%	34 / 27%	27 / 22%	9 / 7%

9. Work Environment Questions Continued

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	Definitely Yes	Yes	Maybe	No	Definitely No
My job workload is high.	33 / 26%	53 / 42%	30 / 24%	9 / 7%	0 / 0%
When computers are down, I cannot do my job.	72 / 58%	34 / 27%	14 / 11%	5 / 4%	0 / 0%
I can count on the computer systems that I use being 'up' and available when needed.	26 / 21%	46 / 37%	36 / 29%	13 / 10%	3 / 2%

10. Thinking about your job, on the whole, are you:		
Very Satisfied	47	38%
Somewhat Satisfied	67	54%
Somewhat Dissatisfied	9	7%
Very Dissatisfied	2	2%
Total	125	100%

11. How many times in the past year have you procured an item through the NAVAIR IT procurement process? Do NOT include orders placed at your request by someone else in your organization (i.e. you delegated the task).		
0	49	39%
1-2	44	35%
3-5	9	7%
6-10	7	6%
11 or more	8	6%
I have never used the process	8	6%
Total	125	100%

12. How would you describe the NAVAIR IT procurement process? (Click all that apply)		
So daunting I am afraid to even learn the process.	25	21%
Complicated and almost impossible to learn the process.	50	42%
Like anything else, you just need to follow the steps.	50	42%
Fairly straightforward and intuitive.	1	1%
So easy anyone can follow the process.	0	0%

13. Have you taken the IT approval training class?		
Yes	35	28%
No (Did not know about IT training)	53	42%
No (Knew about IT training but didn't take it)	37	30%
Total	125	100%

14. Do you use a support team for your NAVAIR IT approvals? (i.e., you delegated the IT Approval task).

Yes	46	37%
No	54	43%
Don't know	25	20%
Total	**125**	**100%**

15. NAVAIR IT Procurement Process Questions

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	Definitely Yes	Yes	Maybe	No	Definitely No	Don't Know
I understand all of the steps in the NAVAIR IT procurement process.	3 2%	16 13%	21 17%	36 29%	36 29%	12 10%
If I don't understand a step in the NAVAIR IT procurement process, that information is readily available.	4 3%	19 15%	42 34%	22 18%	15 12%	22 18%
The NAVAIR IT procurement process is efficient.	2 2%	1 1%	24 20%	26 21%	55 45%	15 12%

16. NAVAIR IT Procurement Process Questions Continued

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	Definitely Yes	Yes	Maybe	No	Definitely No	Don't Know
The rules of the NAVAIR IT procurement process drive me to search for other methods to get the tools that I need.	47 38%	27 22%	23 19%	16 13%	1 1%	10 8%
I have all the IT software that I need to do my job.	2 2%	27 22%	27 22%	36 29%	29 23%	3 2%
I have all the IT hardware that I need to do my job.	2 2%	32 26%	32 26%	28 23%	27 22%	3 2%

17. NAVAIR IT Procurement Process Questions Continued

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	Definitely Yes	Yes	Maybe	No	Definitely No	Don't Know
I have created workarounds for IT software that I need but do not have.	21 17%	41 33%	20 16%	32 26%	5 4%	5 4%
I have created workarounds for IT hardware that I need but do not have.	21 17%	41 33%	19 15%	33 27%	5 4%	5 4%

18. Considering your LAST order, from the time you decided which item to buy until your completed and approved paperwork was delivered to the buyer, how many hours did it take you to complete the NAVAIR IT procurement process? Do NOT include the time you spent researching what to buy or the time it took the vendor to deliver the product.

1-4	23	19%
5-10	19	15%
11-15	9	7%
16-20	8	7%
21 or more	20	16%
Not Applicable	44	36%
Total	**123**	**100%**

19. What was the cost of your last purchase through the NAVAIR IT procurement process?		
$0 to $2,999	55	44%
$3,000 to $9,999	11	9%
$10,000 to $24,999	12	10%
$25,000 to $49,999	2	2%
$50,000 to $99,999	7	6%
Greater than $100,000	1	1%
Not Applicable	36	29%
Total	124	100%

20. Comments		
1	Feel the system is broken	4
2	The current system drives them to find workarounds to IT process	4
3	Are confused between NMCI services and IT approval process	5
4	Want improvement to the system	4
5	Feel there is an inefficiency in the system for purchasing low cost items	5
6	Feel that the process changes too much	4
7	Feel the length of IT process is too long	4
8	Feel that other groups have easier/better access	3
9	Use other methods for purchases besides IT process	2
10	Has used process; works for current work	1
11	Uses procurement team for approvals/purchases	1
12	Have never used the IT process	2
13	Other	3

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